

U-matic.

VIDEOCASSETTE RECORDER

V0-5850

Revised-3

This manual includes the informations of Supplement-1, 2, 3 and 4 that have been published already.



SONY
SERVICE MANUAL

SPECIFICATIONS

GENERAL

Video recording:	Rotary two-head helical scan system Luminance: fm recording Color signal: converted subcarrier direct recording
Video signal system:	EIA standards, NTSC color
Power requirements:	100 - 120 V ac $\pm 10\%$, 50/60 Hz $\pm 10\%$
Power consumption:	75 W with RM-440
AC OUT:	400 W maximum, unswitched
Operating position:	Horizontal
Storage temperature:	-20°C to $+60^{\circ}\text{C}$ (-4°F to $+140^{\circ}\text{F}$)
Operating temperature:	5°C to 40°C (41°F to 104°F)
Dimensions:	Approx. 446 x 237 x 518 mm (w/h/d) (17-5/8 x 9-3/8 x 20-1/2 inches) including projecting parts and controls
Weight:	Approx. 25 kg (55 lb)

VIDEO

VIDEO IN:	BNC type, x2 with 75 ohm termination switch and loop-through output 1.0 V (p-p) ± 1.0 V (p-p), 75 ohms, unbalanced, sync negative
DUB IN:	7 pin, x1
TV:	8 pin, x1
VIDEO OUT:	BNC type, x2 1.0 V (p-p) ± 0.2 V (p-p), 75 ohms, unbalanced, sync negative
DUB OUT:	7 pin, x1
Horizontal resolution:	Monochrome mode: 340 lines Color mode: 260 lines
Signal-to-noise ratio:	Monochrome mode: more than 49 dB Color mode: more than 46 dB
SC IN:	BNC type, x1 2 V (0.5 - 3 V) (p-p), 75 ohms, unbalanced, sync negative
EXT SYNC IN:	BNC type, x1 4 V (2 - 5 V) (p-p), 75 ohms, unbalanced, sync negative
Recording level:	Automatic and manual

AUDIO

LINE CH-1, CH-2 IN:	Phono jack, x 1 in each -10 dB, 47 k ohms
MIC CH-1, CH-2:	Phone jack, x 1 in each -60 dB, for 600 ohm microphones
TV:	8 pin, x1
LINE CH-1, CH-2 OUT:	Phono jack, x 1 in each -5 dB (with 47 k ohms load)
HEADPHONES:	Stereo phone jack, x1 for 8 ohm headphones Level: adjustable (-24 dB to -46 dB)

Signal-to-noise ratio:	Better than 48 dB (at 3% distortion) Both channels 1 and 2
Frequency response:	50 - 15,000 Hz (channels 1 and 2)
Recording level adjustment:	Manual, with audio limiter

EDIT

Assemble:	Video and audio channel 1 and audio channel 2 (simultaneously)
Insert:	Video, audio channel 1 and/or audio channel 2 independently (selectable)
Preroll:	Possible
Automatic editing:	Possible with the RM-440 Automatic Editing Control (optional) Accuracy: ± 2 frames

SPECIAL FUNCTIONS

Pause:	A still picture is obtained, with long pause function
Search:	Possible (still, and 1/30 to 5 times of normal speed in forward and reverse directions) Picture search is possible with the RM-440 when the KCS type tape is used
Tracking control:	Possible
Skew control:	Possible
Sync system:	Internal and external
Vertical-interval switcher:	Internal
Dropout compensator:	Internal
TAPE TRANSPORT	
Tape speed:	9.53 cm/sec. (3-3/4 ips)
Recording or playback time:	60 min (with KCA-60)
Fast forward and rewind time:	within 4 min (with KCA-60)
Wow and flutter:	0.2% RMS
Tape compatibility:	U-matic video cassette tape
Usable tape:	KCA, KCS type tape

ACCESSORY SUPPLIED

AC power cord 1

RECOMMENDED VIDEO EQUIPMENTS AND ACCESSORIES

Editing Control Unit RM-440
Color Video Monitor Sony CVM and PVM series
Color Video Camera Sony DXC series
Auto Search Control RX-353, RX-303
Remote Control
Cleaning Cassette KC-1C
Remote Control Cable RCC-5F
Dubbing Cable VDC-5 (5 m)
Monitor Connecting Cable VMC-3P (3 m), VMC-5P (5 m), VMC-10P (10 m)
Video Responder System VRC-100, VRS-100, VRD-100, VRP-100

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SAFETY CHECK-OUT

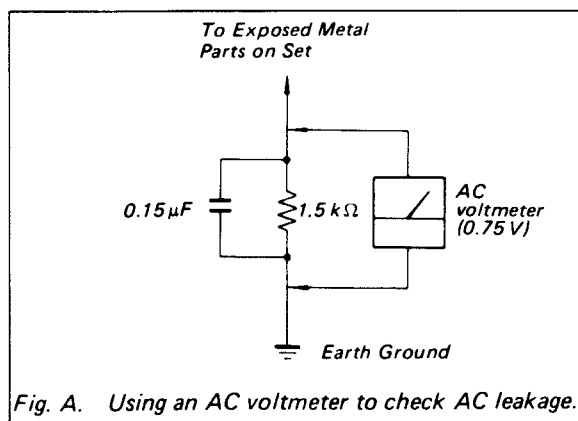
After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)



SECTION 1

GENERAL DESCRIPTION

1-1. FEATURES

Full editing capability

All essential functions for electronic editing, rotary erase head, vertical interval switcher and capstan servo are, of course, incorporated in the VO-5850, plus a number of additional functions such as framing servo and ϕ^2 loop servo to make high-quality editing possible. A new type playback amplifier, a dropout compensator and a noise eliminator insure that you will always have a high-quality picture.

When a RM-440 Automatic Editing Control Unit is connected, you have a totally automatic editing system.

Search operation

Governed by the search dial, playback at 1/30 to 5 times normal speed is possible in both forward and reverse directions. When a KCS cassette is used, picture search (at about 10 times normal playback speed) is also possible with the search dial on the RM-440.

Preroll function

The PREROLL button makes it easy to achieve a stable picture at the edit-in point.

Dubbing connectors

Connectors for editing or duplicating video signals are included.

LED time counter

The time counter reads the CTL signals recorded on the tape and the LEDs indicate the point on the tape in seconds and minutes.

Mark-in function

Any particular point on the tape can be easily and quickly located using the MARK IN button.

Still picture

When the tape is stopped with the PAUSE button during playback, a still picture can be obtained. The guard band noise is limited to the upper or lower part of the screen so that the still picture is easy to see.

Long pause mode

When the tape is stopped in the pause mode for a long period of time, the machine automatically enters the long pause mode to avoid possible damage to the tape.

Moisture detector

When moisture condenses on the video head drum, the moisture detector is activated and the machine stops to avoid possible tape damage. The AUTO OFF indicator lights to indicate moisture condensation.

Remote control and auto search

The machine can be remotely controlled with an optional remote control unit. Any point on the tape can be searched for and played back automatically using an RX-353 or RX-303 Auto Search Control Unit.

Connectors for time base corrector

The best possible playback picture can be obtained when a time base corrector (optional) is connected.

Logic control

The logic control system allows you to change modes without pressing the STOP button.

Full automatic rewind

The tape is automatically rewound to the beginning when it runs to the end.

Video recording level adjustment

The video recording level can be adjusted automatically or manually.

Limiter function

The audio recording level is adjusted manually. The limiter circuit minimizes audio distortion at the program peaks.

Two audio tracks

Two audio tracks permits recording and playback of stereo sound or bilingual program material.

Stable playback picture

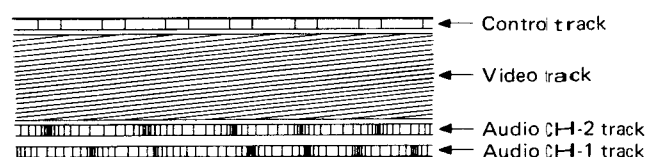
The servo system using a direct drive capstan motor and drum motor, and the newly developed digital servo IC assure a stable tape transport which reduces tape jitter.

No power adaptation and low power consumption

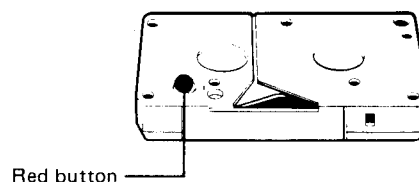
Thanks to Sony's newly-developed high efficiency switching regulator, the unit can be operated with a wide range of power voltages and frequencies without power adaptation. Power consumption is low.

1-2. NOTE ON VIDEOCASSETTE TAPE

The video and audio signals are recorded using the full width of the tape as shown below. Because of this, the tape cannot be recorded in the reverse direction.

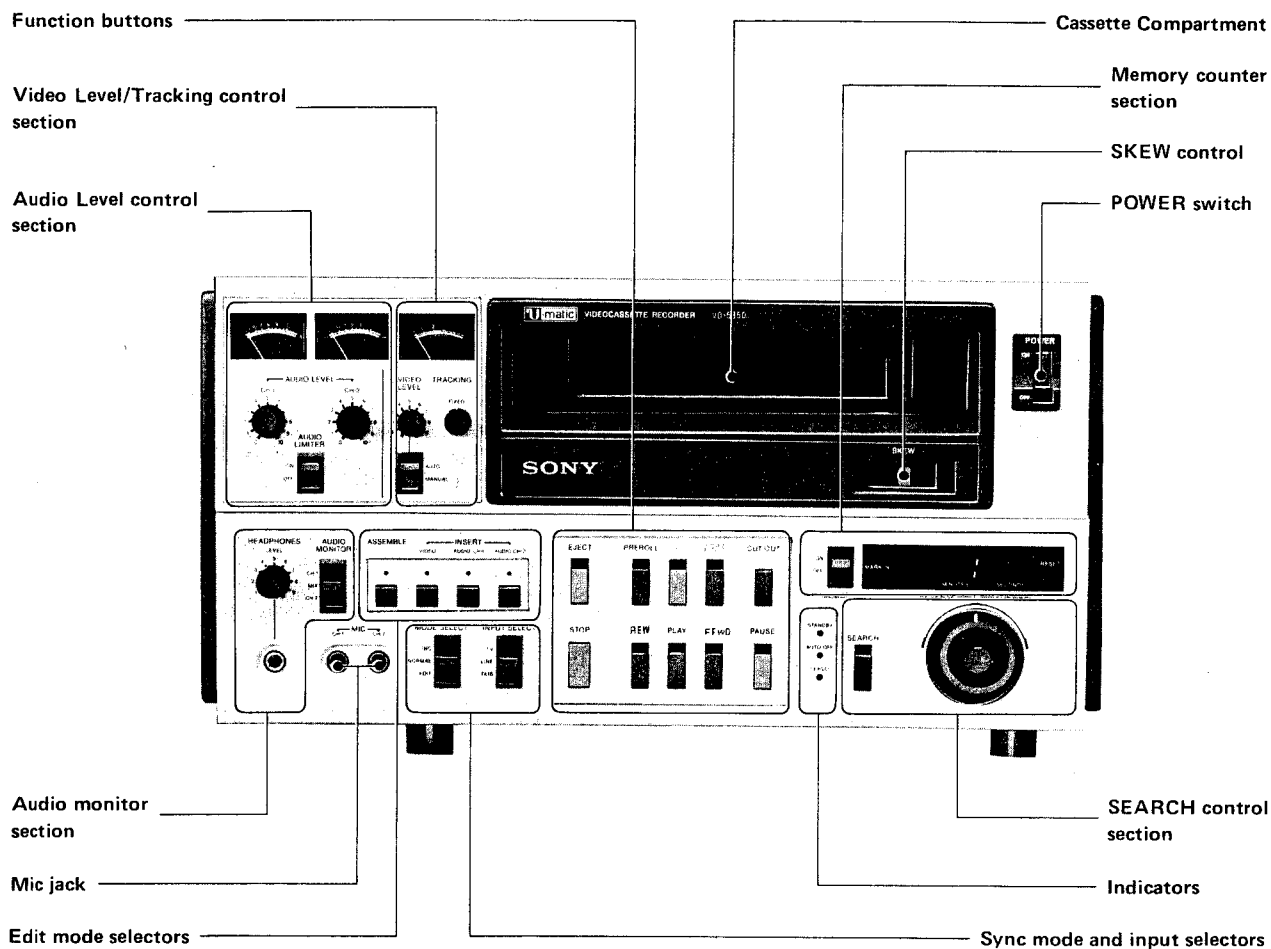


If you want to safeguard the material recorded on a cassette, remove the red button on the bottom so it cannot be recorded when the REC button is pressed. Accidental erasure is now impossible. If you later decide to record on this cassette, replace the button. If a cassette without a red button is inserted into the videocassette recorder, the E-to-E mode picture (see page 9) on the monitor screen is cut off.



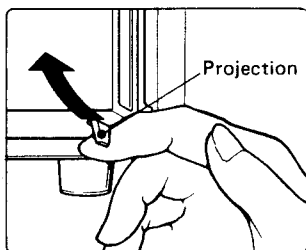
1-3. LOCATION AND FUNCTION OF CONTROLS

FRONT PANEL



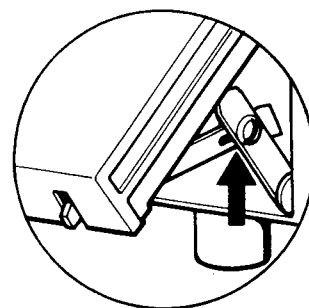
To put the Operation Panel on a Slant

The lower half of the operation panel can be pulled out as shown below.



To put the panel on a slant

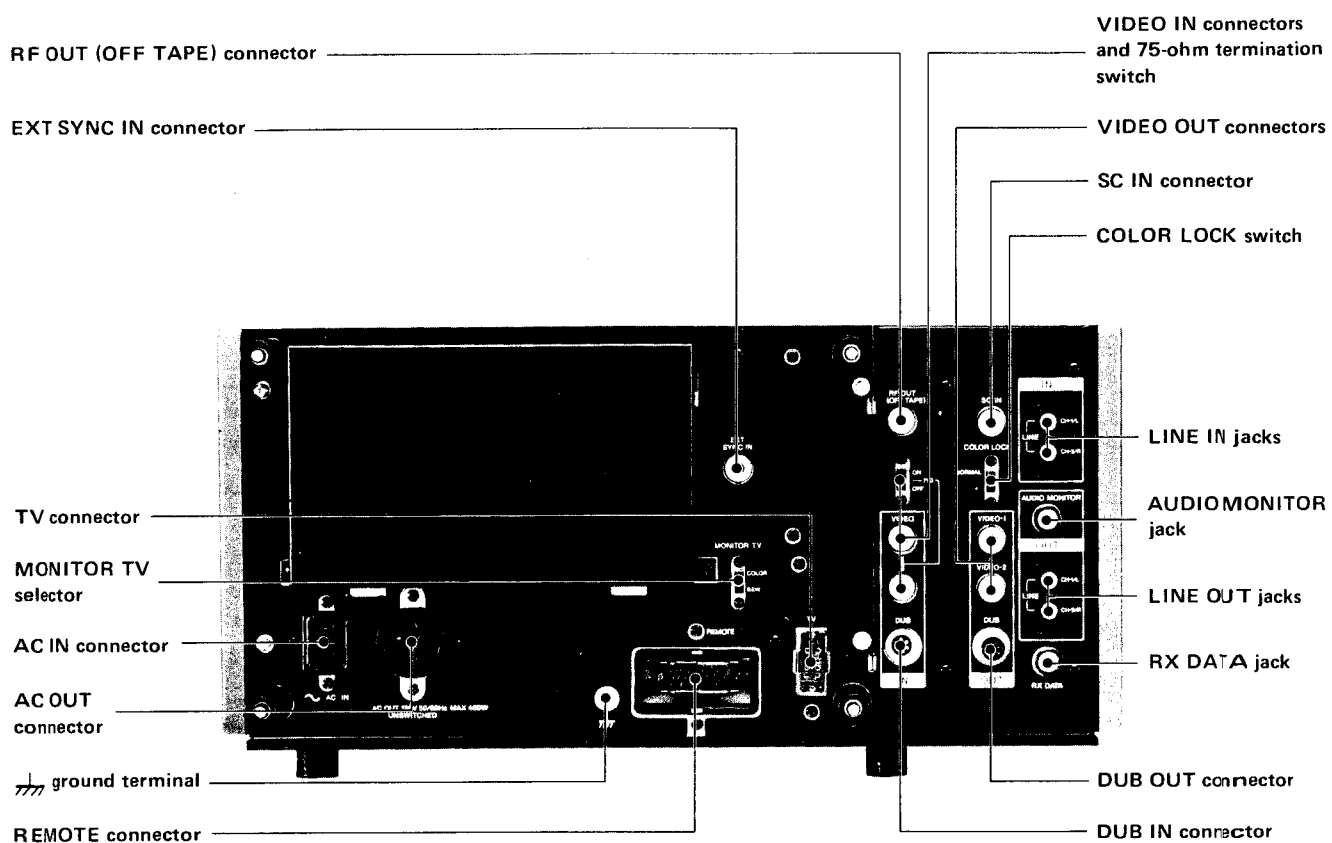
While pulling the projections on the bottom of the operation panel out, swing the bottom of the panel out and up until the side braces lock.



To return the panel to the original position

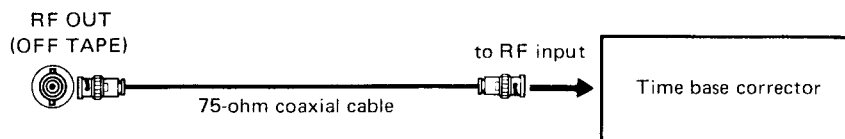
Push up on the side braces to unlock them and swing the panel down and back until it clicks into place.

REAR PANEL

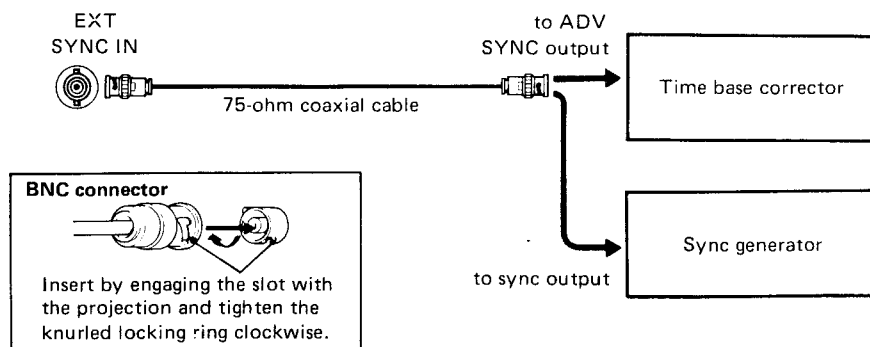


1-4. CONNECTIONS AND SELECT SW SETTING

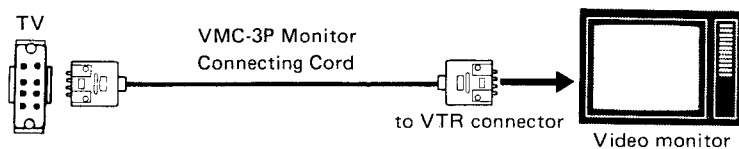
RF OUT (OFF TAPE) connector (BNC type)



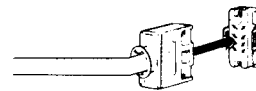
EXT SYNC IN connector (BNC type)



TV connector (8-pin)



Be sure that the connectors are properly aligned before connecting the cable.



To remove, press the buttons on both sides of the connector.

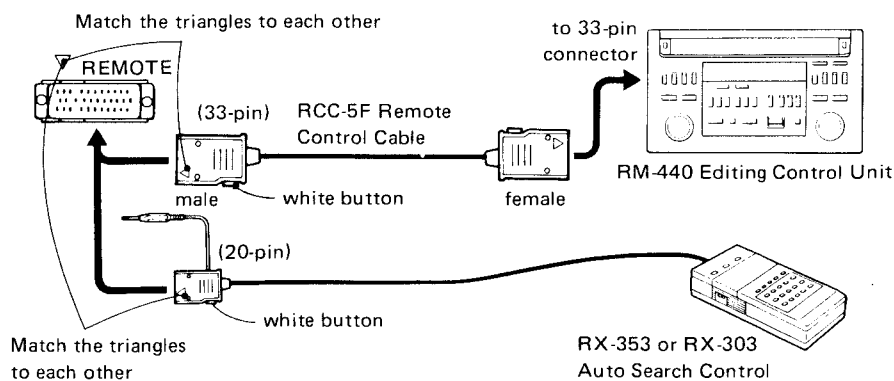
MONITOR TV selector

Set this selector according to the type of video monitor used.

COLOR: For a color monitor.

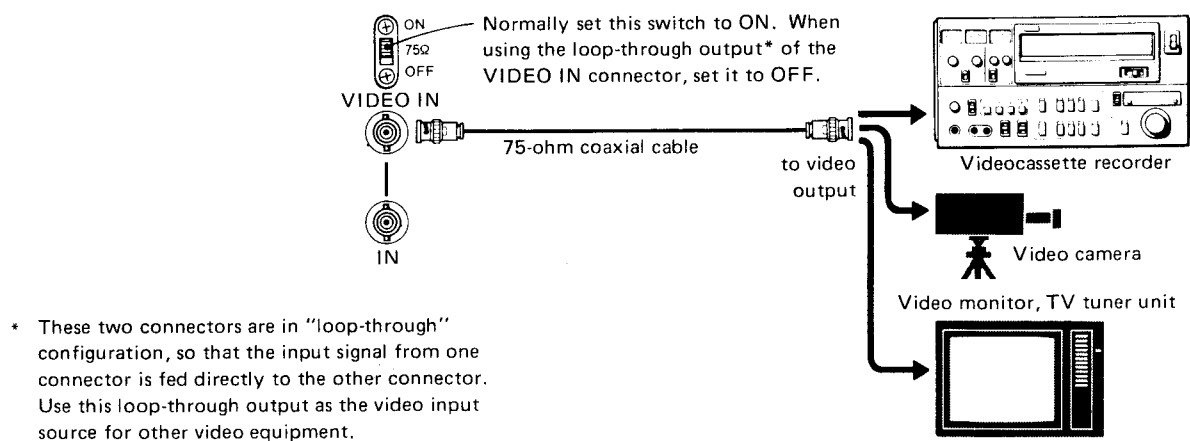
B & W: For a black and white monitor.

REMOTE connector (33-pin)

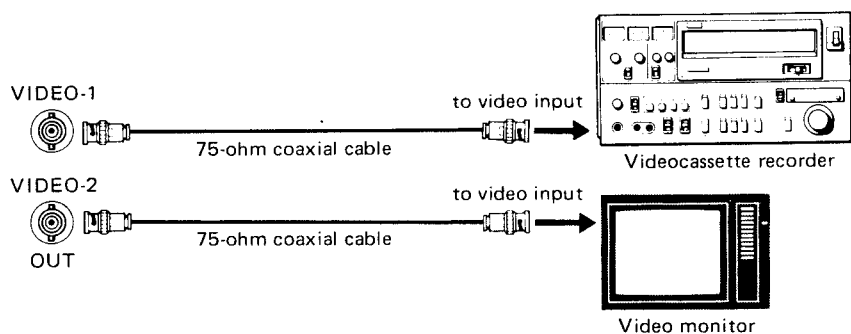


- The REMOTE connector accepts a 20-pin connector. A plug adaptor is unnecessary.

VIDEO IN connectors (BNC type) and 75-ohm termination switch



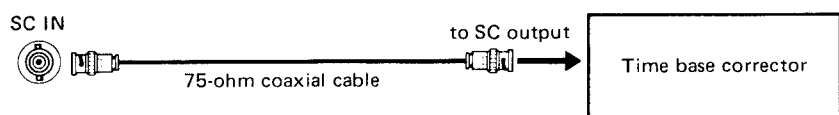
VIDEO OUT connectors (BNC type)



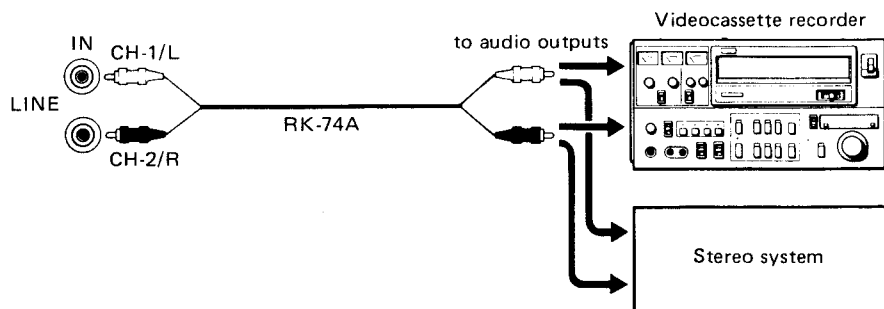
COLOR LOCK switch

As a rule, set to NORMAL. If the playback picture has no color or if the hue is abnormal set the switch to the position marked [*].

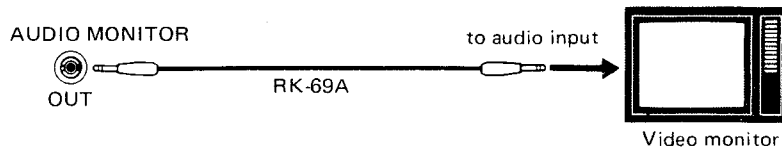
SC IN (subcarrier input) connector (BNC type)



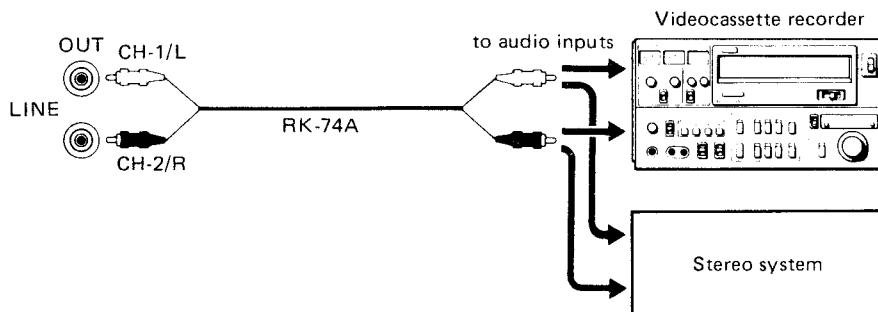
LINE IN (audio line input) jacks (phono type)



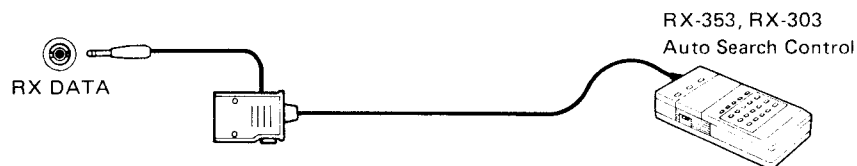
AUDIO MONITOR jack (mini type)



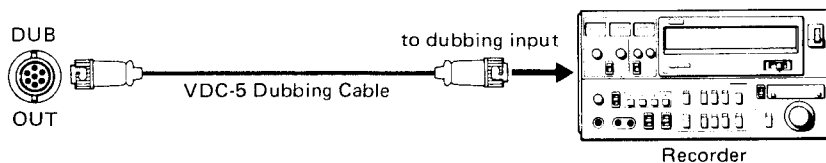
LINE OUT (audio line output) jacks (phono type)



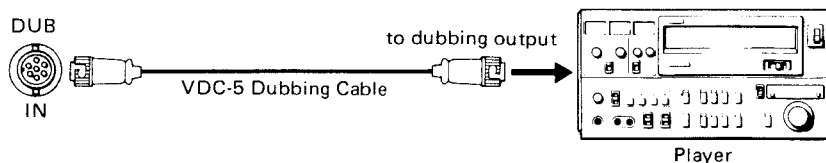
RX DATA jack (mini type)



DUB OUT connector (7 pin)

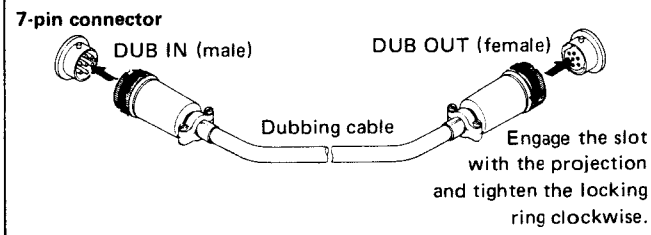
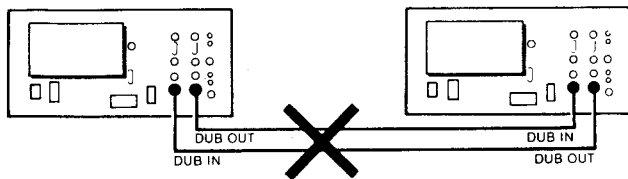


DUB IN connector (7 pin)



NOTE:

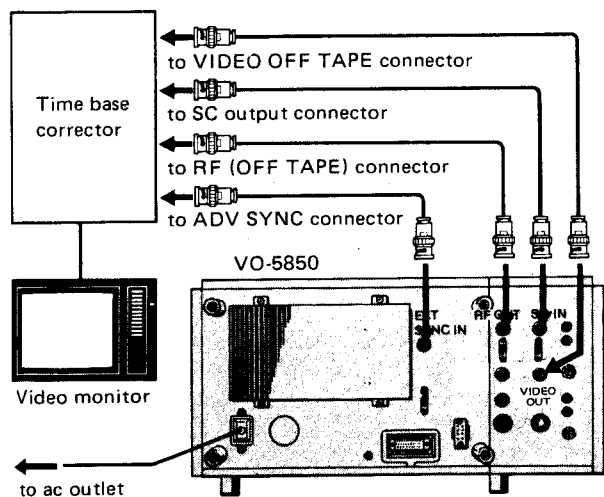
Do not connect the dubbing connectors in parallel.



USING A TIME BASE CORRECTOR

The best possible playback picture can be obtained when a time base corrector is used. Connect the time base corrector as illustrated below, and set the MODE SELECT switch to TBC.

- For details on the operation of the time base corrector, refer to the instruction manual furnished with it.

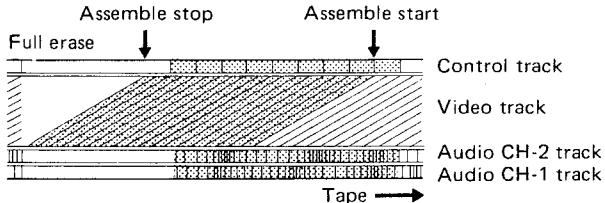
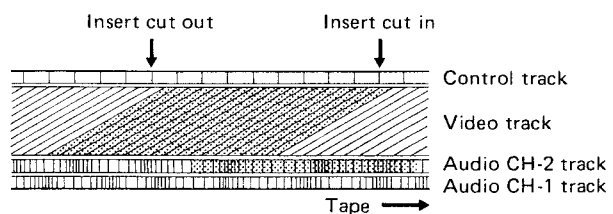


SYNC SYSTEM

The VO-5850 can operate with the internal sync system when no external signal is input, or with the external sync system when an external signal is input. The reference signal is changed depending upon the setting of the MODE SELECT switch and the input signals.

External signals	Recording	Playback
Sync signal 	Sync with the video signal	MODE SELECT TBC NORMAL EDIT Sync with the sync signal Sync with the video signal
Video signal 	Sync with the video signal	
Sync signal 	Sync with the sync signal	
No input signal		Sync with the signal generated by the built-in sync generator

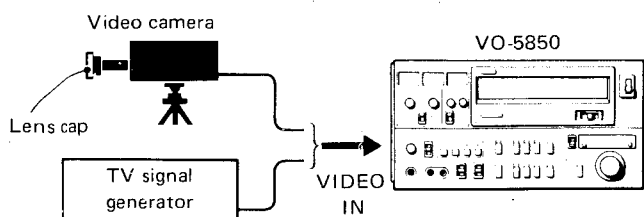
1-5. AUTOMATIC ELECTRONIC EDITING

ASSEMBLY EDITING	INSERT EDITING
The video and audio signals are edited simultaneously. The control signals are also edited at the same time so that you can edit the scenes on a new tape as easy as possible.  The diagram shows four tracks: Control track, Video track, Audio CH-2 track, and Audio CH-1 track. A 'Full erase' arrow points to the beginning of the Control track. 'Assemble stop' and 'Assemble start' arrows point to specific points on the Control track. A 'Tape' arrow points to the right. NOTE: Because at the cut-out point the erased portion is triangular, the picture will be unstable at that point when assembly editing is used to add a new scene to the recorded tape.	The video, audio channel 1 and audio channel 2 can be edited independently or simultaneously. In the insert editing, the signals are edited in reference to CTL signals previously recorded on the tape. Insert editing is recommended in the following cases: – for inserting new scenes on a recorded tape. – for adding the sound effects or commentary onto a tape which already has the video signals recorded on it. – for adding video signals onto a tape which already audio signals recorded on it.  The diagram shows four tracks: Control track, Video track, Audio CH-2 track, and Audio CH-1 track. 'Insert cut out' and 'Insert cut in' arrows point to specific points on the Control track. A 'Tape' arrow points to the right. NOTE: Continuous CTL signals must be recorded before insert editing.

How to Record the CTL Signals

CTL signals are usually recorded together with the video signals. However CTL signals can be recorded by themselves in the following ways:

- Record the signals from a camera whose lens cap is in place, or
- Record the black burst signal from a TV signal generator.

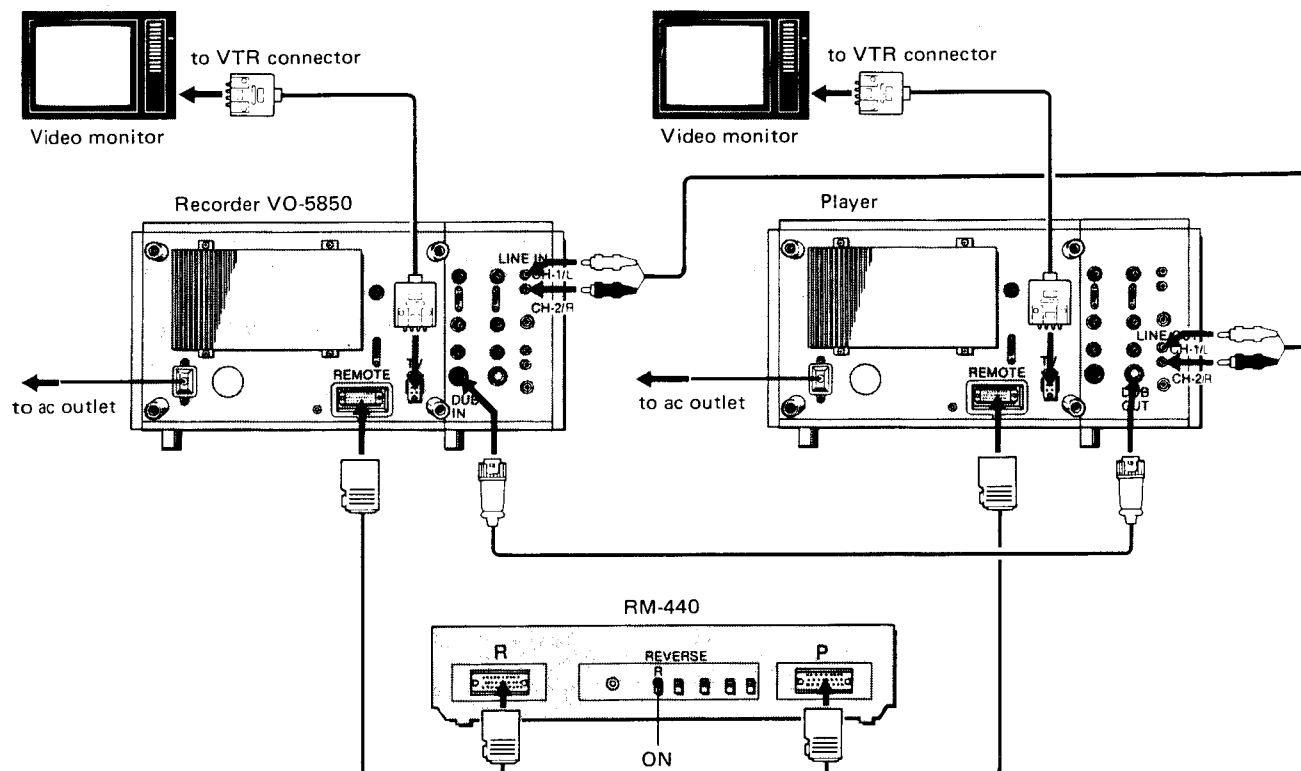


When the RM-440 Automatic Editing Control Unit is used with the VO-5850, accurate and automatic tape-to-tape editing is possible. Once the edit-in and edit-out points have been memorized on the RM-440, the editing can be done simply by pressing the AUTO EDIT button.

Almost all functions of the RM-440 can be activated when the RM-440 is used with the VO-5850. However, picture search is possible only when a KCS cassette is used.

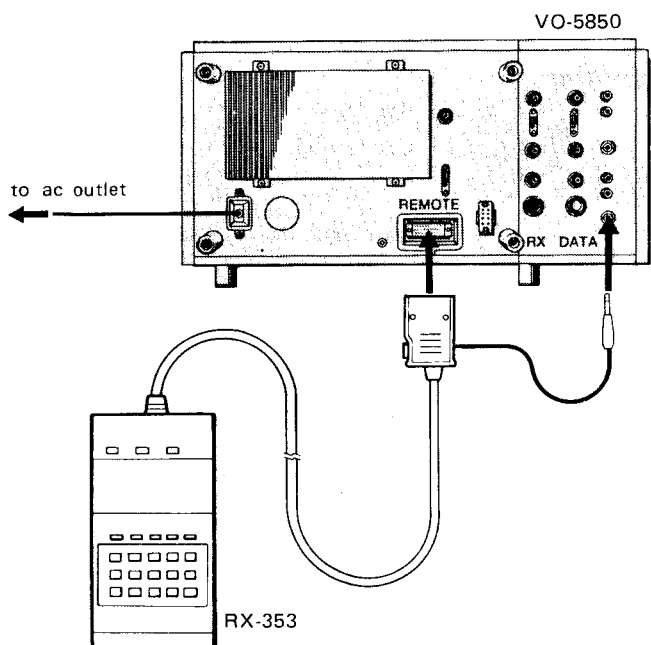
- During picture search, the picture may become monochrome or roll vertically on some monitors. If this happens, release the picture search mode by turning the search dial.

Editing Connections



1-6. AUTO SEARCH CONTROL

The RX-353 divides the recorded material into segments. A segment has its own number and the beginning and end position on the tape, and we call them the segment data. The segment data can be recorded at the beginning of the audio channel 1 on the tape, and be kept even if the RX-353 is disconnected or the power of the recorder is turned off. So the data can be used repeatedly.



NOTES:

- The data recording level is automatically adjusted. So the level adjustment is not necessary.
- Do not run the tape with the function buttons or search dial on the VO-5850 when the RX-353 is used. This is because the indication on the tape position indicator of the RX-353 and the actual tape position do not correspond correctly when the VO-5850 is used to run the tape.

1-7. NOTE ON MODE

Search dial

After pressing the SEARCH button, turn this dial to control the speed and direction of tape travel during the search for a particular point on the tape. You can vary the tape speed from 1/30 to 5 times normal playback speed. When the dial is set at the center "0" position, the picture will be still.

- When this dial is used, the servo system is not locked so the guard band noise flows on the playback picture.

SEARCH button

Press to engage the search dial.

RESET button

Press to reset the time counter to "00 minutes 00 seconds". The point memorized by the MARK IN button will be cancelled.

Time counter

This counter counts the CTL signals on the tape during playback, and the CTL signals begin recorded during recording and indicates the tape running time at the normal playback speed in minutes and seconds (up to 99 minutes 59 seconds).

MARK IN button

Press to memorize a particular point on the tape.

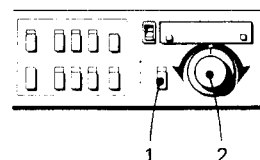
MEMORY switch

When this switch is set to ON, the tape will automatically stop the point where the MARK IN button was pressed or, if the MARK IN button has not been pressed, where the time counter indicates "00 00" in the rewind or search mode.

- During editing or when the REMOTE connector is used, be sure to set this switch to OFF.

Search operation

A particular point can be quickly located with the search dial. Press the SEARCH button and turn the search dial to look for the edit-in point. The search dial allows you to vary the playback speed from 1/30 to 5 times the normal playback speed in both directions. Set the search dial to the center "0" position at the edit-in point. The tape stops and a still picture can be seen on the monitor.



NOTES:

- During search operation, the servo system is not locked, so guard band noise flows on the playback picture.
- When the video signal is connected using the DUB OUT and IN connectors, the E-to-E mode picture on the monitor connected to the recorder may roll vertically when the player is in the search mode.
- When the video signal is connected using the LINE OUT and IN connectors, the color of the E-to-E mode picture on the monitor connected to the recorder may be lost when the player is in the search mode. If this happens, set the COLOR LOCK switch to a different position.
- If the MODE SELECT switch is set to TBC but a time base corrector is not connected, the vertical sync does not lock and the picture rolls vertically.

The long pause mode

If the pause mode continues for more than 8 minutes, the tape around the head drum automatically slackens to protect the video head and the tape.

This is called the long pause mode.

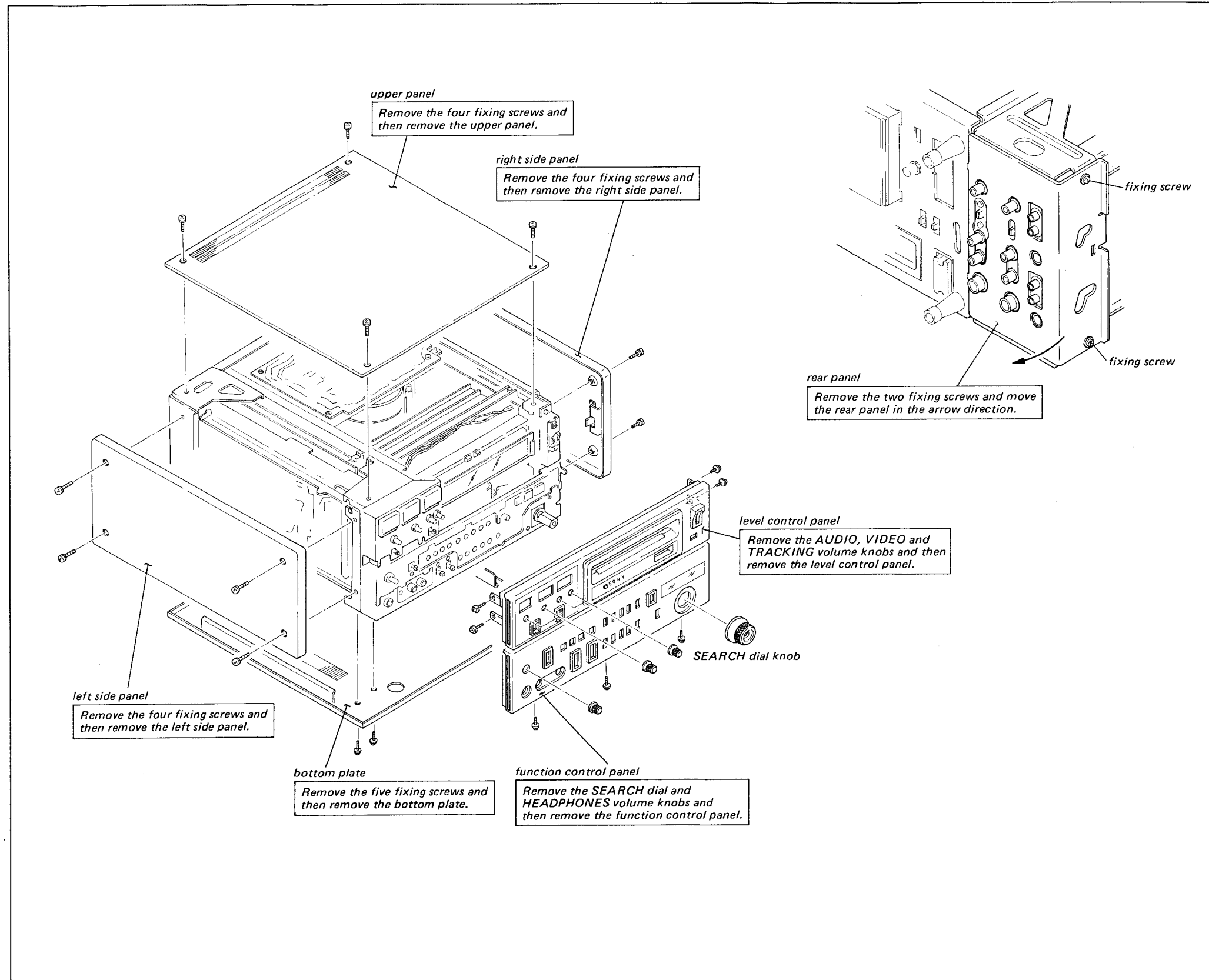
If the STAND BY indicator remains lit and any of function buttons (except for the EJECT button) does not operate the recorder.

Eject the cassette and take up the leader tape manually by turning the reel to the direction of the arrow on the bottom until the leader tape is completely taken up.

Insert the cassette again.

SECTION 2 SERVICE INFORMATION

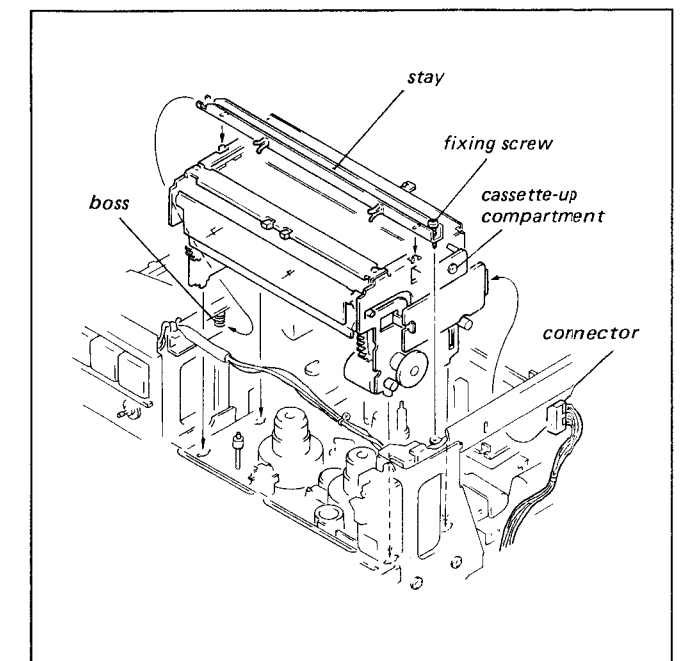
2-1. DISASSEMBLY OF CABINET



2-2. CASSETTE-UP COMPARTMENT REMOVAL AND INSTALLING PROCEDURES

- (1) Remove the upper panel and right side ornamental panel.
- (2) Disconnect the connector of cassette-up compartment.
- (3) Disconnect the harness from the stay.
- (4) Loosen the fixing screw of the right-end of stay.
- (5) Remove the stay from boss of side panel.
- (6) Remove the cassette-up compartment.

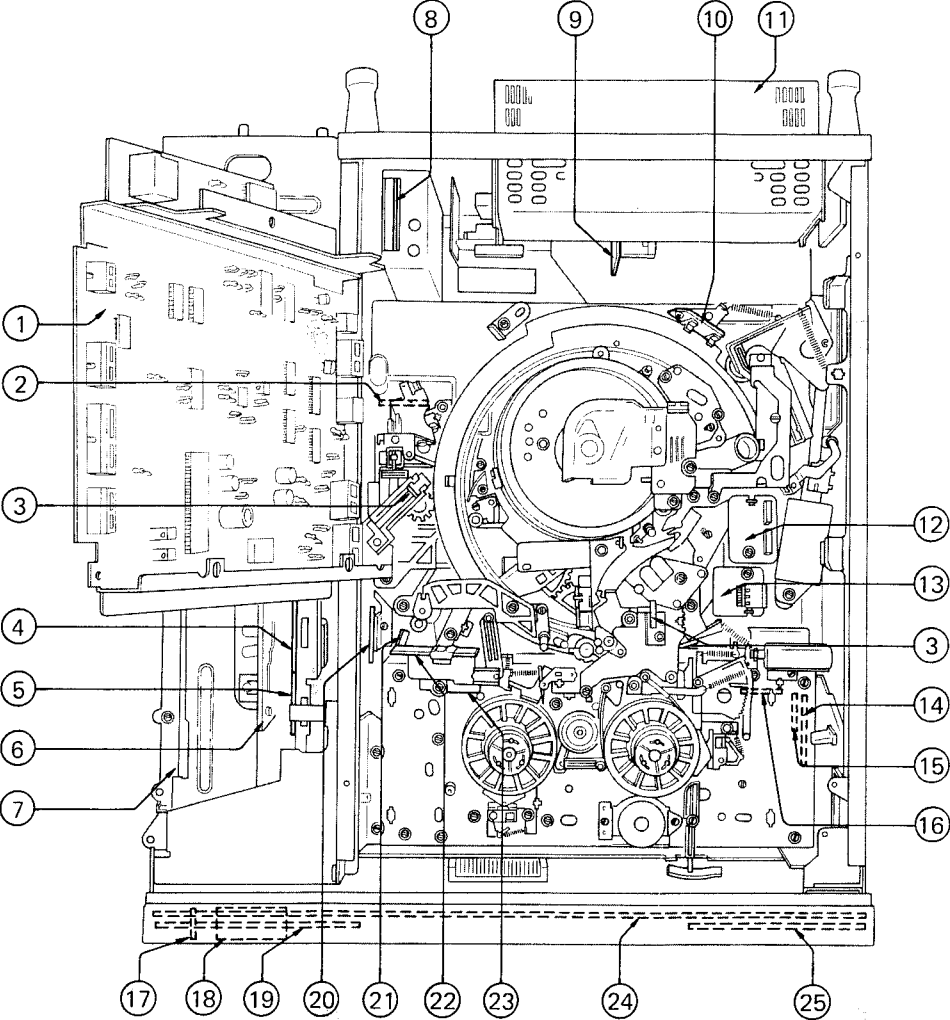
Reverse the removal procedure for installing the cassette-up compartment.



2-3. MAIN PARTS LOCATION

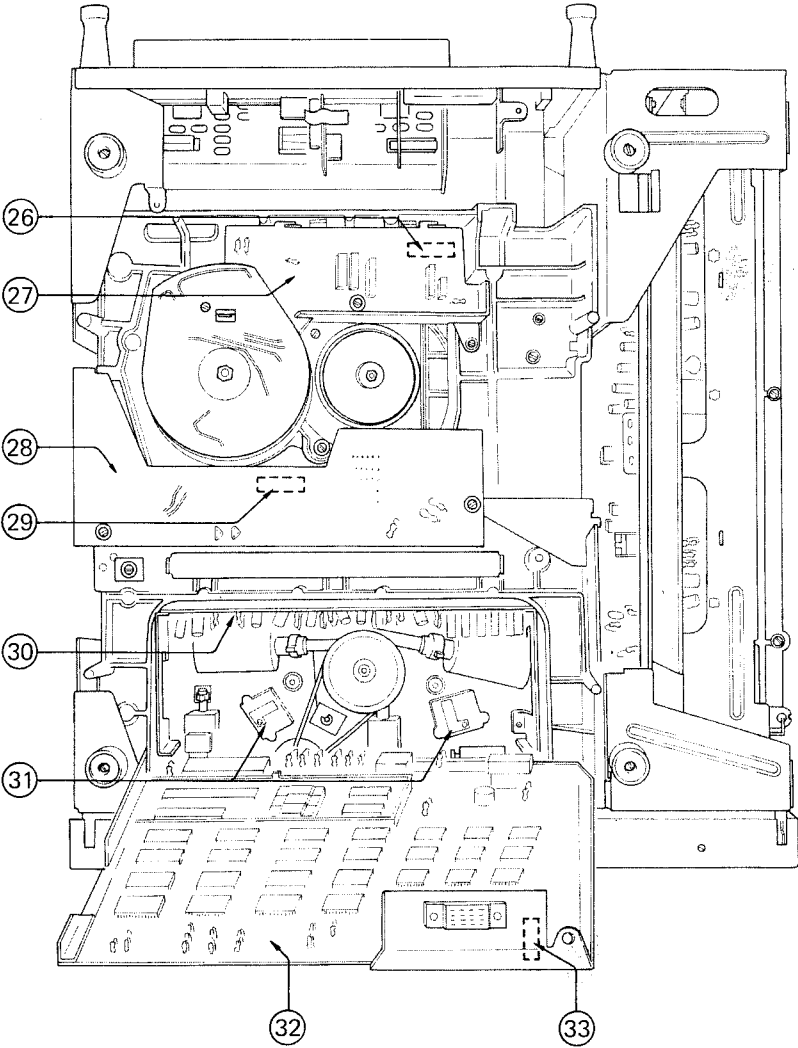
2-3-1. Location of the Printed Circuit Boards

< TOP VIEW >



- | | |
|---|--|
| ① SV-31 BOARD | ⑭ CC-9 BOARD (Assembled into cassette-up compartment) |
| ② LM-7 BOARD | ⑮ CC-11 BOARD (Assembled into cassette-up compartment) |
| ③ PH-5 BOARD | ⑯ CC-10 BOARD (Assembled into cassette-up compartment) |
| ④ MP-12 BOARD (with CB-6 and DL-2 boards) | ⑰ HP-3 BOARD |
| ⑤ BS-3 BOARD | ⑱ MI-3 BOARD |
| ⑥ DM-22 BOARD | ⑲ MC-17 BOARD |
| ⑦ AU-21 BOARD | ⑳ ML-1 BOARD |
| ⑧ RE-5 BOARD | ㉑ SW-50 BOARD |
| ⑨ AC-26 BOARD | ㉒ SW-46 BOARD |
| ⑩ FR-11 BOARD | ㉓ PH-4 BOARD |
| ⑪ UR-01 (switching regulator) | ㉔ KY-13 BOARD |
| ⑫ AH-3 BOARD | ㉕ DP-10 BOARD |
| ⑬ EC-19 BOARD | |

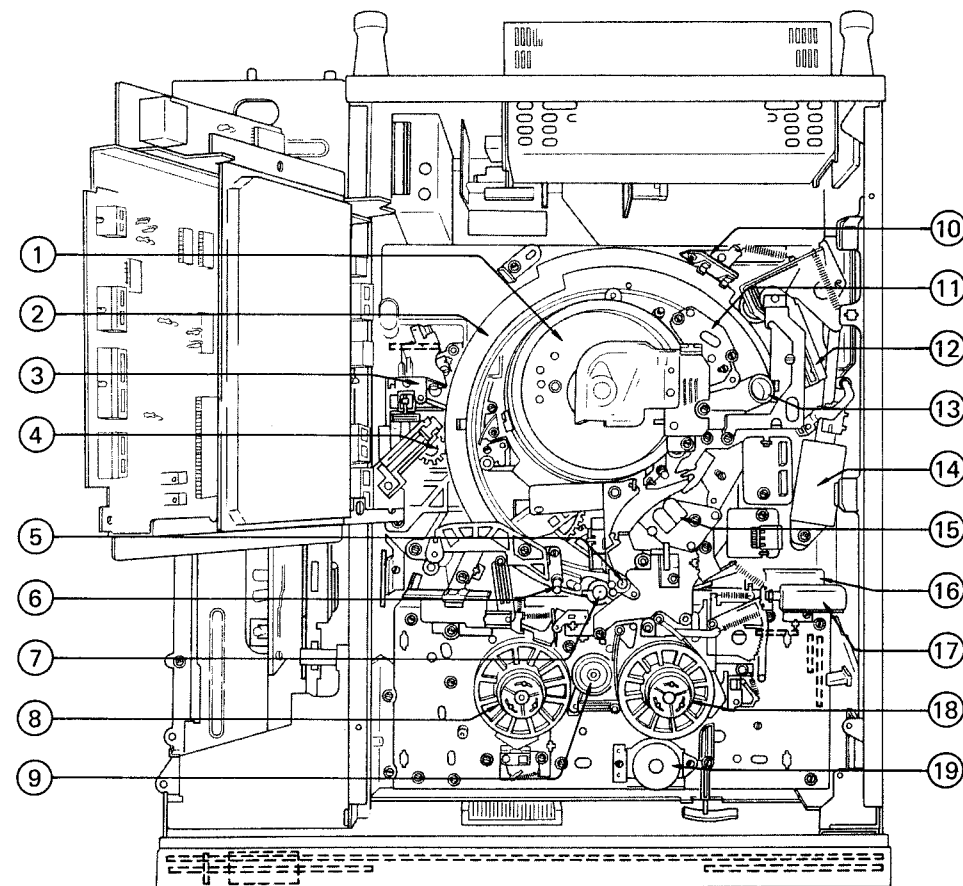
< BOTTOM VIEW >



- | |
|------------------------|
| ②⑥ PT-9 (A) BOARD |
| ②⑦ DC-10 BOARD |
| ②⑧ MR-6 or MR-11 BOARD |
| ②⑨ PT-9 (B) BOARD |
| ③⑩ PD-16 BOARD |
| ③⑪ SW-43 BOARD |
| ③⑫ SY-68 BOARD |
| ③⑬ PT-9 (C) BOARD |

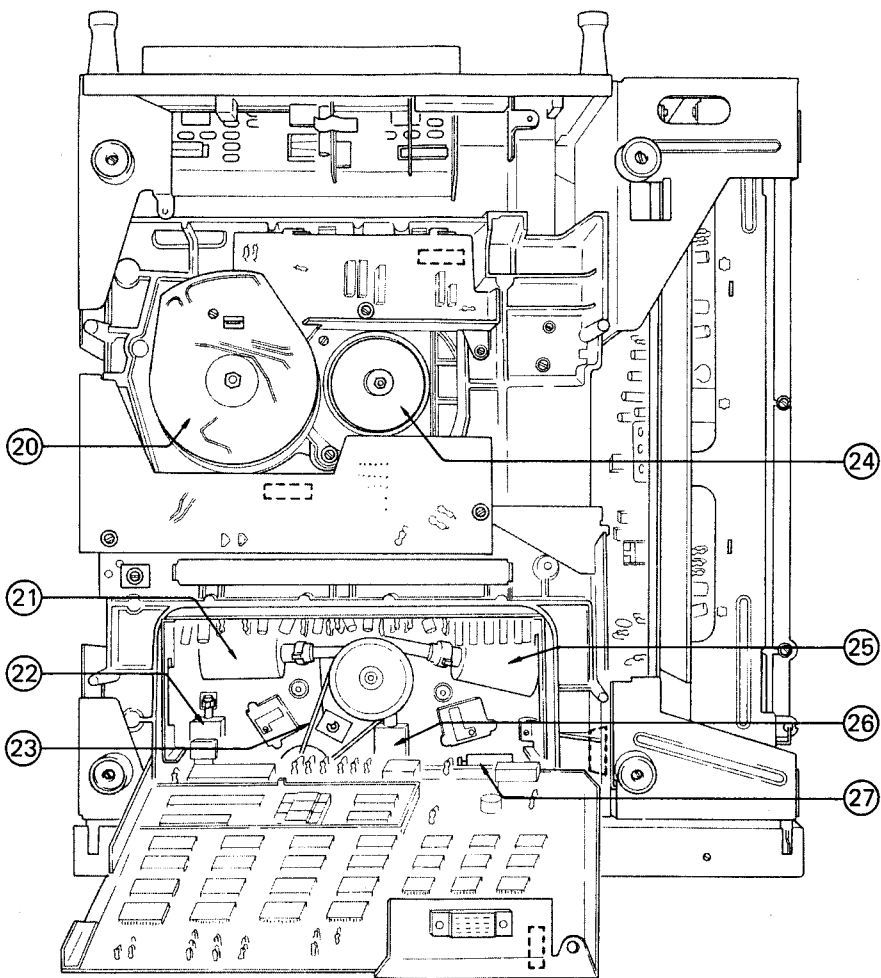
2-3-2. Location of the Mechanical Main Parts/Components

< TOP VIEW >



- | | |
|----------------------|---------------------|
| ① Head drum | ⑪ Audio/CTL head |
| ② Threading ring | ⑫ Pinch lever |
| ③ T correction guide | ⑬ Capstan shaft |
| ④ Gear box | ⑭ Pinch solenoid |
| ⑤ S drawer arm | ⑮ CTL/Erase head |
| ⑥ T drawer arm | ⑯ Search solenoid |
| ⑦ Pinch roller | ⑰ Skew solenoid |
| ⑧ Take-up reel table | ⑱ Supply reel table |
| ⑨ FF/REW idler | ⑲ Reel motor |
| ⑩ FR detector | |

< BOTTOM VIEW >



- | |
|------------------------------------|
| ⑳ Capstan motor |
| ㉑ Supply idler solenoid |
| ㉒ Supply brake solenoid |
| ㉓ Belt for FF/REW idler |
| ㉔ Drum motor |
| ㉕ Take-up idler solenoid |
| ㉖ 10 times picture search solenoid |
| ㉗ Take-up brake solenoid |

2-4. SPARE PARTS

1. Safety Related Components Warning.
Components identified by shading marked with Δ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose part numbers appear in this manual or in service bulletins and service manual supplements published by Sony.
2. Replacement Parts supplied from Sony Parts Center will sometimes have a different shape from the original parts. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts". This manual's exploded views and electrical spare parts list indicate the parts numbers of "the standardized genuine parts at present".
Regarding engineering parts changes in our engineering department, refer to Sony service bulletins and service manual supplements.
3. Printed Components in Bold-Face type on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The remaining parts are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

2-5. SELECT SWITCH SETTING

Along with the select switches on the control panel and the connector panel, the switches listed below are on the circuit boards.

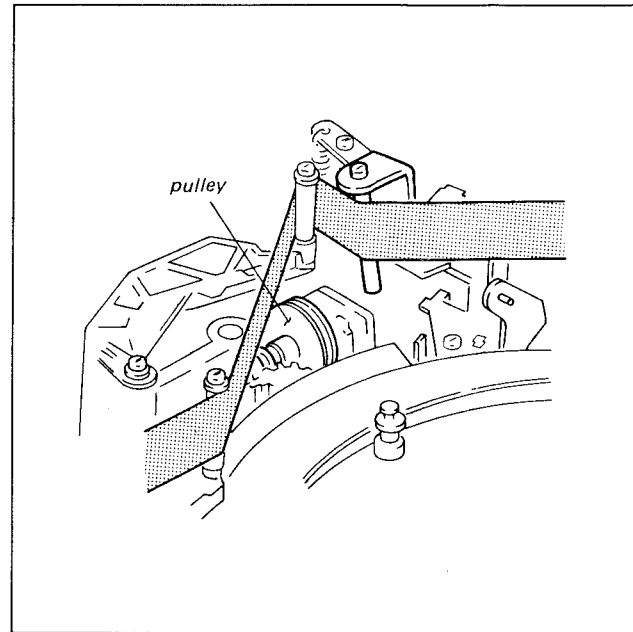
- DM-22 board
NOISE CANCELLER sw. (Ref. No. S1)
In used to increase the signal to noise ratio when needed.
SHARP: Sharpness of a picture is maintained.
SOFT: Signal to noise ratio is increased.
When the set is shipped, NOISE CANCELLER switch is set to the SHARP position.
Note that the NOISE CANCELLER switch must be in the SHARP position in the normal operation of the VO-5850.
- MP-12 board
MINOR PRE-EMPHASIS sw. (Ref. No. S1)
VO-5850 has the Y-HIGH FREQUENCY PRE-EMPHASIS circuit in modulator system circuit. VO-2850, VO-2800, VO-2600 and VP-2000 does not have this circuit. Therefore, when the tape-to-tape editing is performed with VO-5850 and these machines, it is recommended to this switch is set to OFF position.
When the set is shipped, MINOR PRE-EMPHASIS switch is set to ON position.

2-6. CASSETTE REMOVAL PROCEDURE WHEN NORMAL EJECTION IS NOT POSSIBLE

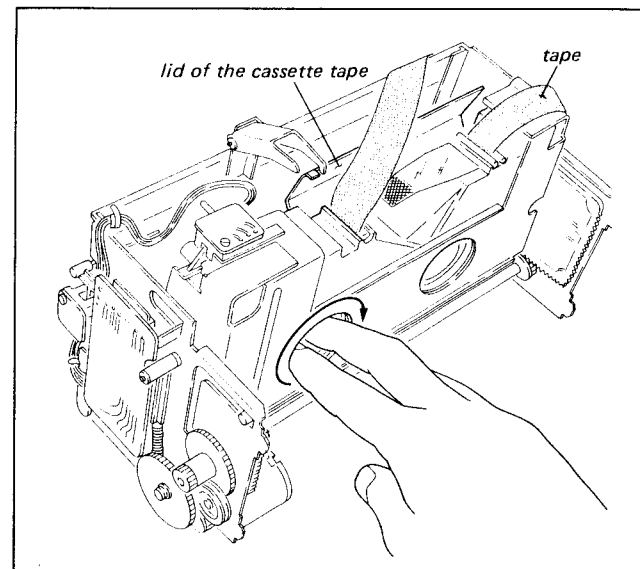
If the eject operation becomes impossible due to trouble or the cassette-up compartment does not rise when the eject operation takes place, the cassette tape can be removed from the set by the procedures described below.

- (1) Turn off the POWER.
- (2) Remove the upper panel and right side ornamental panel.

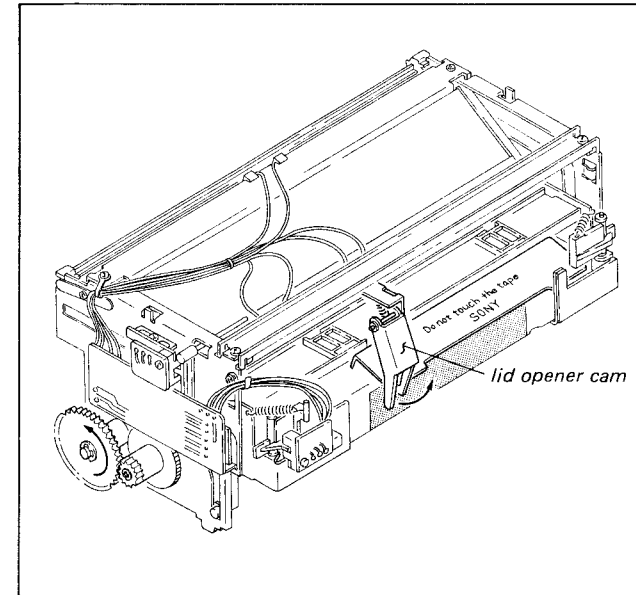
- (3) Turn the white colored pulley of the gear box in the clockwise direction with finger until the threading ring places into the FR-STOP position.
(The threading ring moves in the unthreading direction. But the tape remains at the position of threading completion.)



- (4) Disconnect the connector of the cassette-up compartment.
- (5) Loosen the right-end fixing screw of the stay, and remove the stay from the boss of the side panel.
- (6) Bring up the cassette-up compartment with the cassette tape in it slowly. Remove the tape remaining in the set carefully so that it does not damage.
- (7) Hold the cassette tape lid so that it does not close. Wind the tape into the cassette tape by turning the reel hub on the back of the cassette tape with finger.



- (8) Raise the cam for opening the lid and close the cassette tape lid.



- (9) Remove the tape from the cassette compartment.
- (10) Turn the gear on the right side of the cassette compartment counterclockwise direction by hand in order to place the cassette compartment into the up state.
- (11) Locate the cause of the trouble and remedy the problem.

2-7. TO OPERATE THE MACHINE WITHOUT INSTALLING CASSETTE TAPE

- (1) Remove the cassette-up compartment referring to sec. 2-2. (Tape beginning sensor and tape end sensor are disabled according to disconnect the connector of cassette-up compartment.)
- (2) Turn off the POWER. (The machine is put into the FR-STOP mode automatically.)
- (3) The machine can be placed into the desired mode by pressing the function button to corresponding to the mode.

2-8. TO SET UP 10 TIMES PICTURE SEARCH MODE WITHOUT RM-440

- Search picture at 1/30 to 5 times normal speed can be obtained in both forward and reverse directions by the SEARCH dial on the function control panel. When the KCS cassette is inserted into VTR and the RM-440 is connected to VTR, 10 times picture search is also obtained with the SEARCH dial on the RM-440.

- If RM-440 is not available, 10 times picture search mode is set up as the following procedures.

[1] Serial Number: up to 10440 (USA)
: up to 20110 (CND)

- (1) Unsolder the jumper solder between IC101 pin 4 and IC23 pin 2 on SY-68 board.
- (2) Temporarily connect 10k Ω resistor between IC101 pin 4 and IC23 pin 2 on SY-68 board.
- (3) Short between IC23 pin 2 and E8 on SY-68 board with jumper lead.
- (4) Unsolder the jumper solder between IC119 pin 10 and IC25 pin 6 on SY-68 board.
- (5) Temporarily connect 10k Ω resistor between IC119 pin 10 and IC25 pin 6 on SY-68 board.
- (6) Short between IC25 pin 6 and E8 on SY-68 board with jumper lead.
- (7) Short between CN23 pin 11 and E8 on SY-68 board with jumper lead.
- (8) FWD direction picture search
Short between CN22 pin 5 and E8 with jumper lead.
REV direction picture search
Short between CN22 pin 5 and +5 V line with jumper lead.

[2] Serial Number: 10441 and later (USA)
: 20111 and later (CND)

- (1) Unsolder the jumper solder between IC136 pin 4 and IC33 pin 6 on SY-68 board.
- (2) Temporarily connect 10k Ω resistor between IC136 pin 4 and IC33 pin 6 on SY-68 board.
- (3) Short between IC33 pin 6 and E8 on SY-68 board with jumper lead.
- (4) Unsolder the jumper solder between IC134 pin 3 and IC32 pin 4 on SY-68 board.
- (5) Temporarily connect 10k Ω resistor between IC134 pin 3 and IC32 pin 4 on SY-68 board.
- (6) Short between IC32 pin 4 and E8 on SY-68 board with jumper lead.
- (7) Short between CN23 pin 11 and E8 on SY-68 board with jumper lead.
- (8) FWD direction picture search
Short between CN22 pin 5 and +5 V line with jumper lead.
REV direction picture search
Short between CN22 pin 5 and E8 with jumper lead.
After check and/or adjustment is performed, the reset circuit is made to original.

2-9. TAPE SLACK DETECTOR

If the tape is not taken up and tape slack is occurred in the machine, these conditions are detected with the reel rotation detector under the reel table. The reel rotation detector is composed with the slit of the reel table and the photointerrupter. If the reel table is stopped its rotation more than the listed time in FWD, REV and unthreading modes, the reel rotation detector circuit detect as the tape slacks in the machine, and generates the auto stop signal.

Mode	Time
x1 speed ~	0.3 sec.
x1/10 ~ x1 speed	1.6 sec.
~ 1/10 speed	9.6 sec.

2-10. STOP (E-to-E) MODE

When the cassette tape that the red button is placed on the bottom is inserted into the VTR, the E-to-E picture is obtained on the monitor screen in the FR-STOP mode. The E-to-E picture is also obtained in the EJECT completion (cassette-up) mode.

If you want to set up into the STOP (E-to-E) mode in electrical adjustment, perform the above-mentioned step.

NOTE: Do not use the alignment tape to set up the STOP (E-to-E) mode.

2-11. FIXTURE

Description	Part Number
Drum Eccentricity Gauge (3)	J-6001-820-A
Drum Eccentricity Gauge (2)	J-6001-830-A
Drum Eccentricity Gauge (1)	J-6001-840-A
Drum Eccentricity Gauge (4)	J-6001-930-A
Dihedral Adjusting Screw	J-6002-290-A
Flatness Plate	J-6009-830-A
Reel Table Height Check Base Jig	J-6130-010-A
Reel Table Height Check Jig	J-6130-020-A
Pinch Lever Adjustment Jig	J-6150-020-A
Cleaning Fluid	Y-2031-001-0
Cleaning Piece	2-034-697-00
Torque Measurement Tape (100 mm dia.)	3-702-215-01
Back Tension Adjustment Jig	3-702-216-01
Sony Oil	7-661-018-01
Tension Scale (50 g full scale)	7-732-050-20
Tension Scale (100 g full scale)	7-732-050-30
Tension Scale (200 g full scale)	7-732-050-40
Tension Scale (500 g full scale)	7-732-050-50
Alignment Tape, RR5-2SA	8-960-015-03
Thickness Gauge	9-911-053-00
Head Demagnetizer, HE-4	Standard products.

2-12. PRINTED CIRCUIT BOARD

The circuit board information is provided below.

SYSTEM	BOARD	CIRCUIT FUNCTION
VIDEO	MP-12	• Luminance and Chrominance Signal Modulator • REC/PB Amplifier
	CB-6	• Video Input Connector Board
	DM-22	• Luminance and Chrominance Signal Demodulator
	DL-2	• 1H Delay

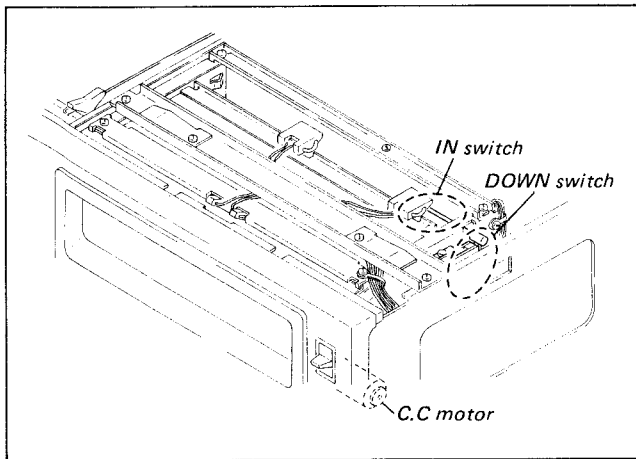
AUDIO	AU-21	• Audio REC/PB Amplifier • Bias/Erase Oscillator
	MI-3	• CH-1/CH-2 Mic Input
	HP-3	• Headphones Level Control/Headphones Jack
	EC-19	• Full Erase/CTL PB Head
	AH-3	• Audio REC/PB/Erase and CTL REC/PB Head
	MC-17	• Audio/Tracking Meter and Level Control
SERVO	SV-31	• Drum/Capstan Speed and Phase PWM Servo • CTL REC/PB Amplifier
	MR-6 (RS-6) MR-11	• Threading/Cassette Compartment Motor Driver • Skew/Search/Pinch Solenoid Driver • Reel Motor Control and Driver
	PT-9 (A)	• Drum Motor Power Driver
	DC-10	• Drum/Capstan Motor Driver • DME Shaper
	PT-9 (B)	• Reel Motor Power Driver
EDIT	RE-5	• Rotary Erase
	BS-3	• Blanking Switcher
POWER SUPPLY	AC-26	• AC Input
	UR-01	• Switching Regulator
	DC-10	• Power Supply
SYSTEM CONTROL	FR-11	• Threading Ring Mechanical Position Detector
	PH-4 PH-5	• Tape Tension Detector • Tape Beginning Sensor • Tape End Sensor
	KY-13	• Function Key Board • Display Driver • Mode/Input/Monitor Select
	DP-10	• Display
	PD-16	• Take up Idler/Brake and Supply Idler/Brake REW FF Search Solenoid Driver
	SW-43	• Take up Reel Rotation Detector • Supply Reel Rotation Detector
	ML-1	• Hours Meter
	LM-7	• Threading Motor
	SW-46	• Miss REC Detector • KCA/KCS Detector
	SW-50	• Unthread End Detector
	CC-9	• Cassette Compartment Motor/PL
	CC-10	• Cassette in Detector
	CC-11	• Cassette Down Detector
	SY-68	• System Control Micro Processor
	PT-9 (C)	• Regulator for System Control

2-13. CASSETTE-UP COMPARTMENT OPERATION

The cassette insertion system in the VO-5850 is a front access system. The cassette compartment drops automatically after the cassette tape has been inserted into the cassette compartment and threading action is started after the cassette is seated in the home position.

The timing of the electronic switches and motor are referring sec. 2-15.

The cassette down switch, cassette in switch and cassette compartment motor operates as follows:

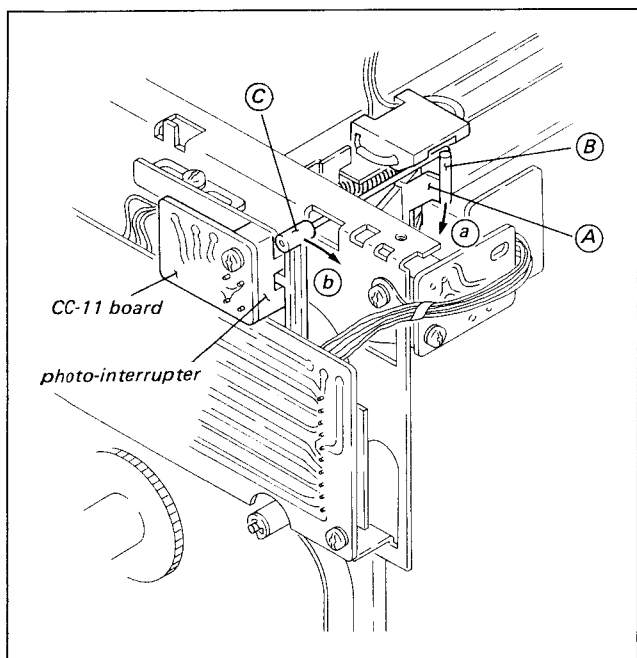


(1) Cassette Down Switch

The cassette tape is inserted by hand and then the cassette pushing lever (called **A**) for making the sentence simple) moves in the direction indicated by arrow **a**.

The down switch arm (called **C**) which has been held by the pin (called **B**) of the **A** moves in the direction shown by arrow **b** with the movement of **A**, and the shutter of **C** opens the photo-interrupter on the CC-11 board.

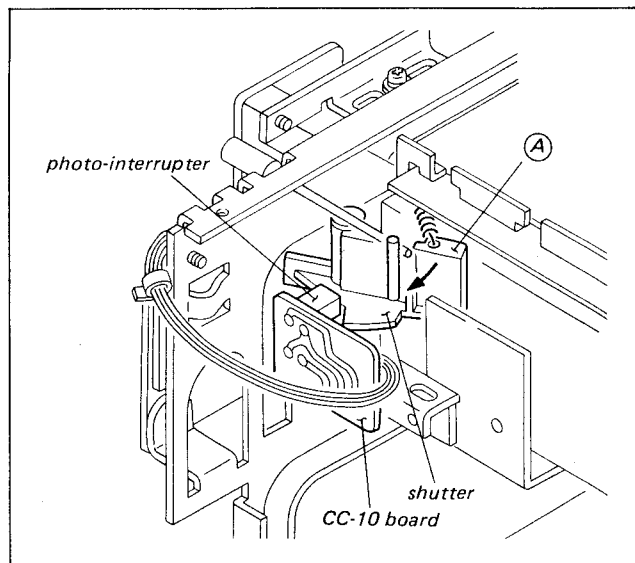
Then the DOWN switch turns to "L".



(2) Cassette In Switch

The cassette tape is inserted by hand further after the DOWN switch operates (until the cassette is stopped).

The **A** shutter covers the photo-interrupter on the CC-10 board and the IN switch turns to "H".



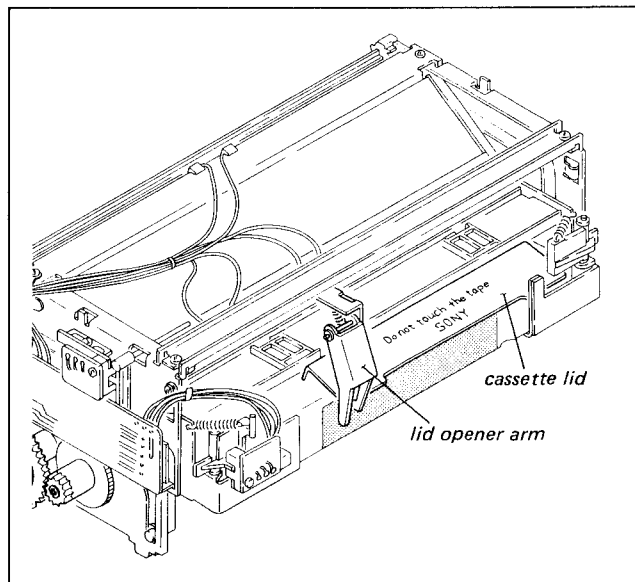
(3) Cassette Compartment Motor (C.C. Motor)

When the IN switch turns to "H" after the cassette insertion, about 11.3 V is impressed on the C.C. motor via the CC-9 board and the motor starts. The power of the motor moves the cassette compartment through the belt and the gears.

(4) Cassette Tape Lid Opener

When the cassette tape is inserted, the C.C. motor rotates, and the cassette compartment moves.

The lid opener arm holds the bottom section of the cassette lid at the point where the horizontal movement of the cassette compartment changes to the vertical movement. The lid is opened following with the downward movement of the cassette compartment.



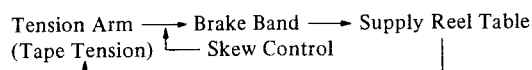
2-14. TAPE TENSION CONTROL MECHANISM

The tape tension control mechanism of VO-5850 is composed with the mechanical and electrical tape tension control mechanisms.

- (1) The tape tension control mechanism in normal playback, record, FWD search and unthreading modes (when the take-up reel table rotates in the counterclockwise direction (except FF mode)) is as follows:

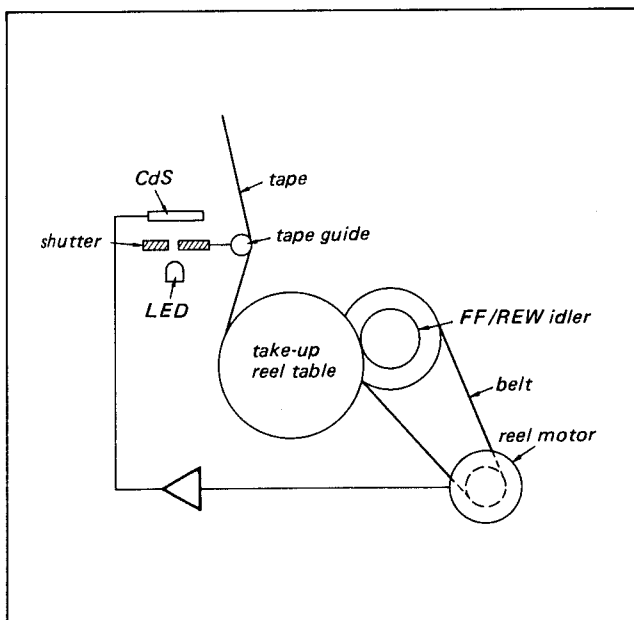
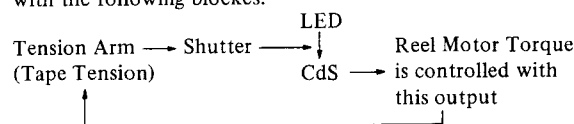
- (i) Tape feeding side (supply reel table side)

The tape back tension control mechanism of the tape feeding side is the same as the conventional VTR. This back tension control mechanism is the mechanical tape tension control mechanism.



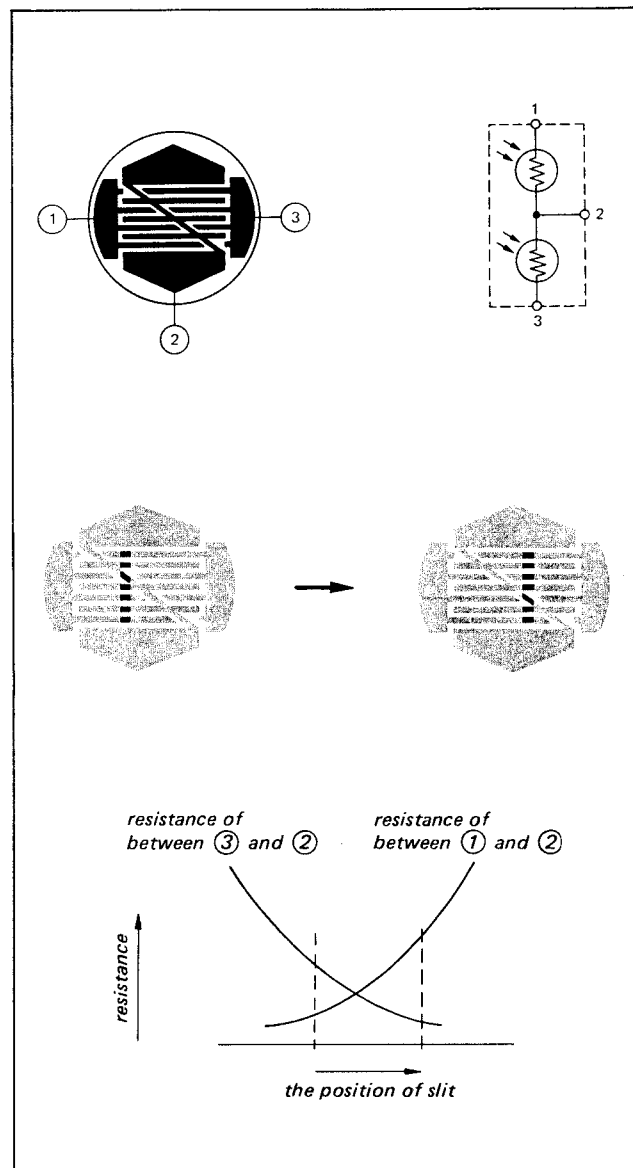
- (ii) Tape taking-up side (take-up reel table side)

The tape tension of the take-up side is controlled with the electrical tape tension control mechanism. The R brake shoe is released from the take-up reel table in this mode. The electrical tape tension control mechanism is composed with the following blocks.



The light emitted by an LED is received by the CdS detector element through a slit on the shutter connected with the tape guide. The electrodes' pattern of this CdS is shown in figure.

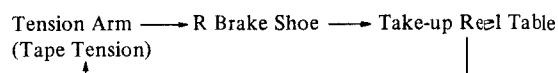
The slit moves with the tape tension change and the point where the light reflector moves. Then the resistance values between ① ~ ② and the resistance between ③ ~ ② are vary. The tape tension around the tension detector tape guide is detected by the resistance variation. This resistance variation output controls the reel motor torque and the tape tension is controlled.



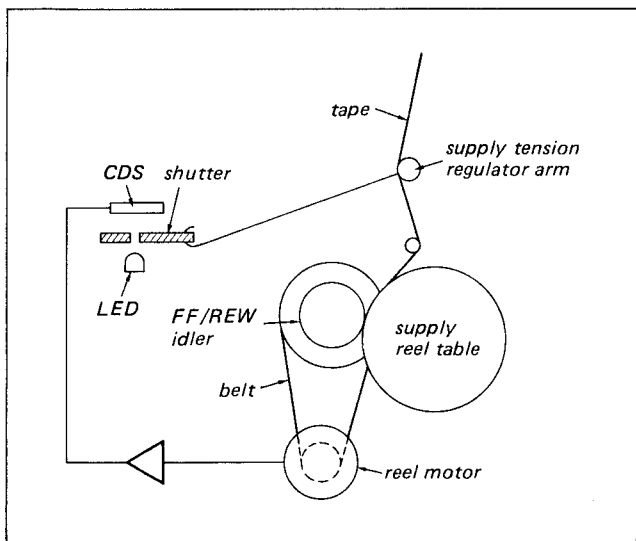
- (2) The tape tension control mechanism in REV search mode (when the supply reel table rotates in the counterclockwise direction (except REW mode)) is as follows:

- (i) Tape feeding side (take-up reel table side)

The tape is supplied from the take-up reel table in this mode. The tape tension control mechanism is the same as the supply side tape tension control mechanism as mentioned former.



- (ii) Tape taking-up side (supply reel table side)
The tape tension of the take-up side (supply reel table side) is controlled with the electrical tape tension control mechanism.

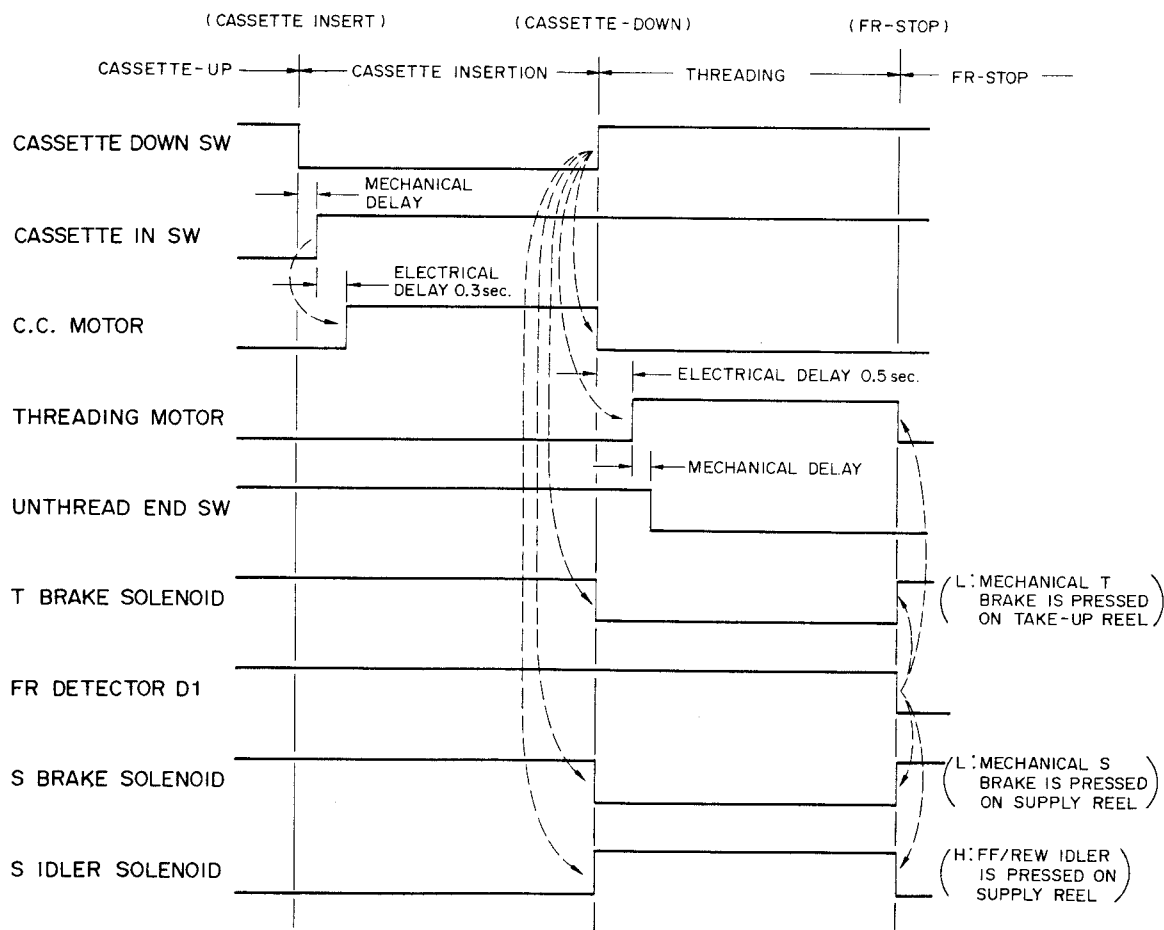


2-15. TIMING OF SWITCH, MOTOR AND SOLENOID

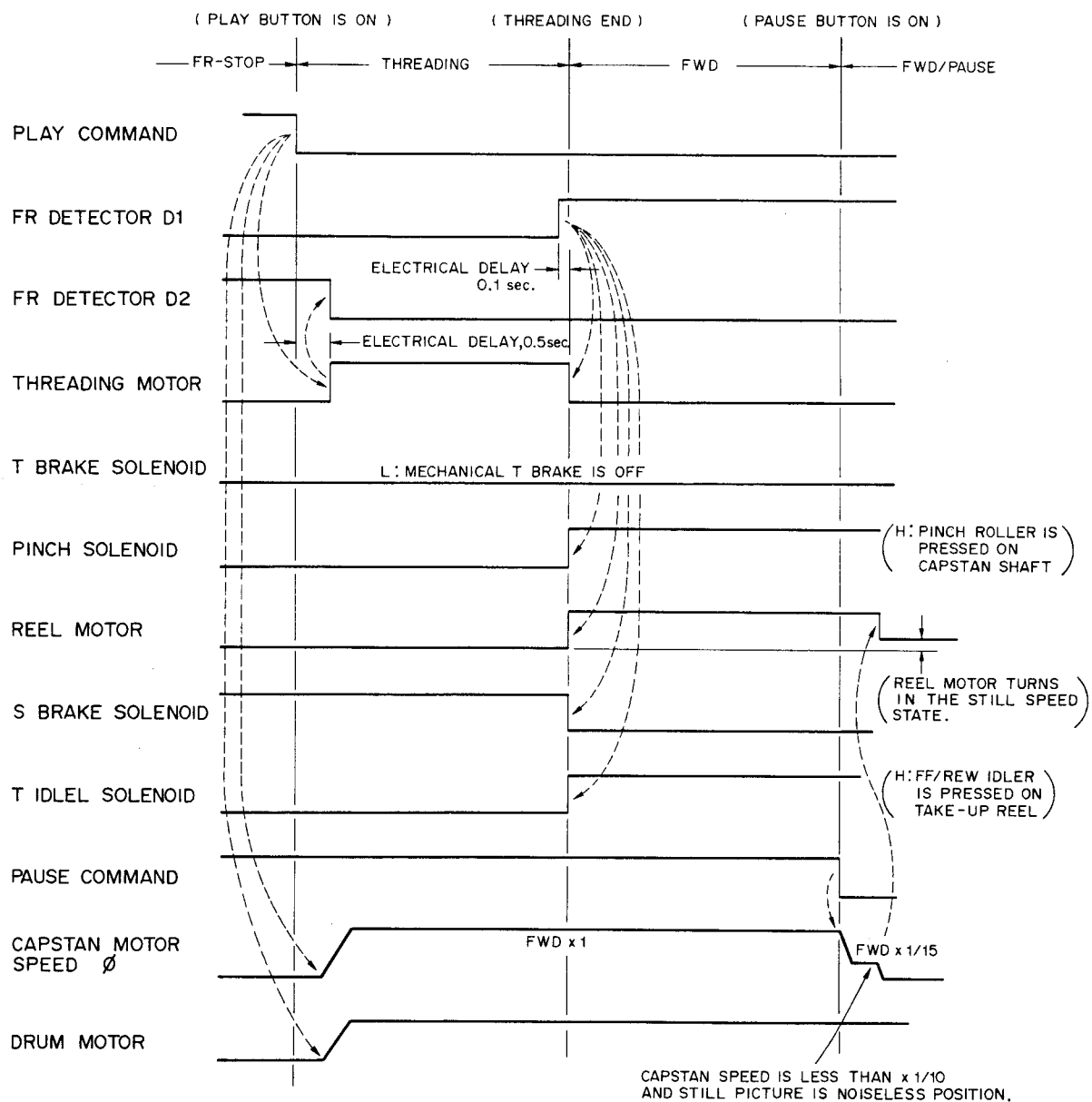
- The timing of the electronic switches, motors and solenoids in the following modes are follows.

Cassette in → FR-STOP
FR-STOP → FWD → FWD/PAUSE
FR-STOP → REC → REC/PAUSE
FWD → FWD SEARCH → REV SEARCH
FWD → FR-STOP
FR-STOP → FF → FR-STOP
FR-STOP → EJECT Completion

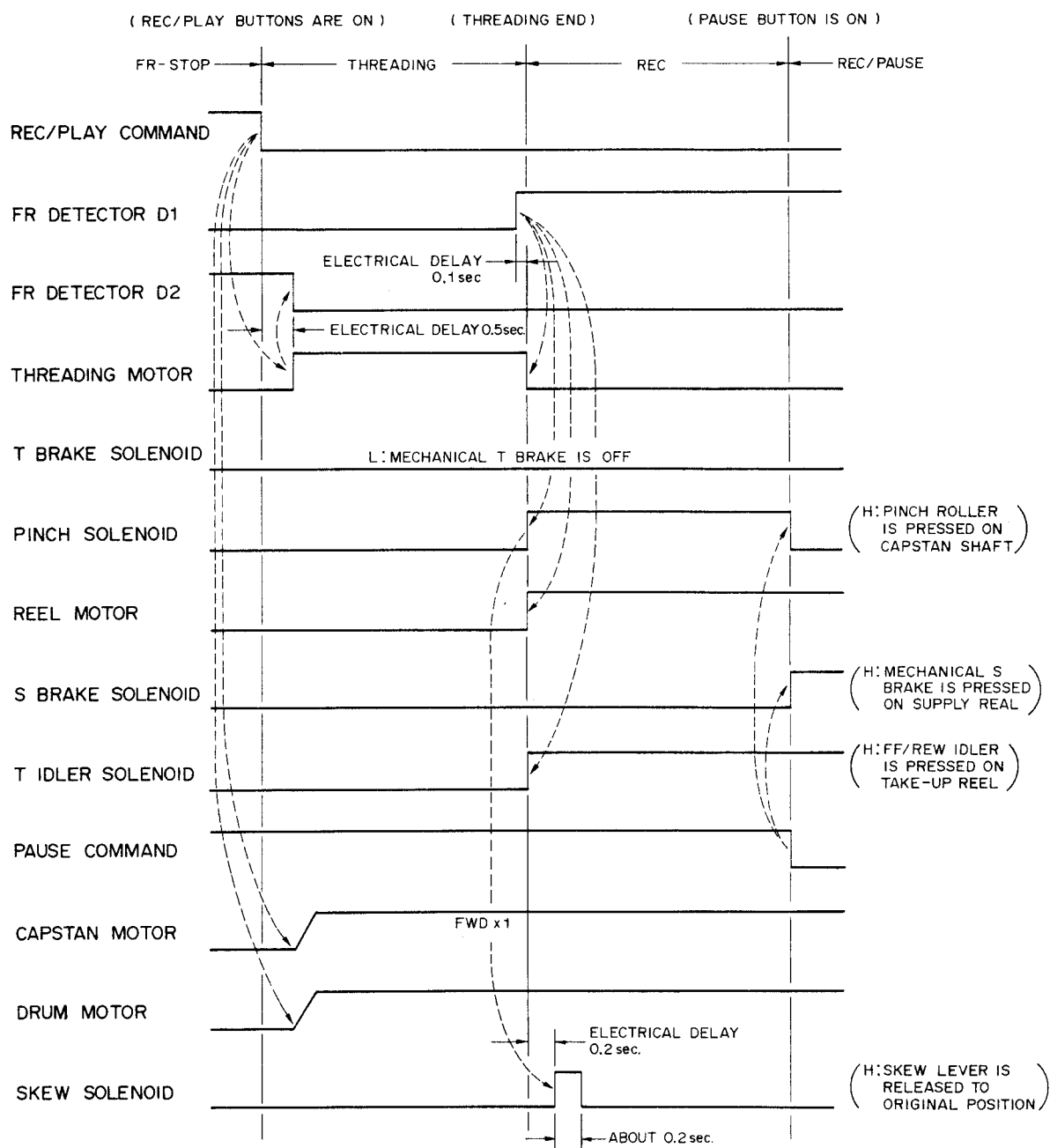
• CASSETTE - IN → FR - STOP



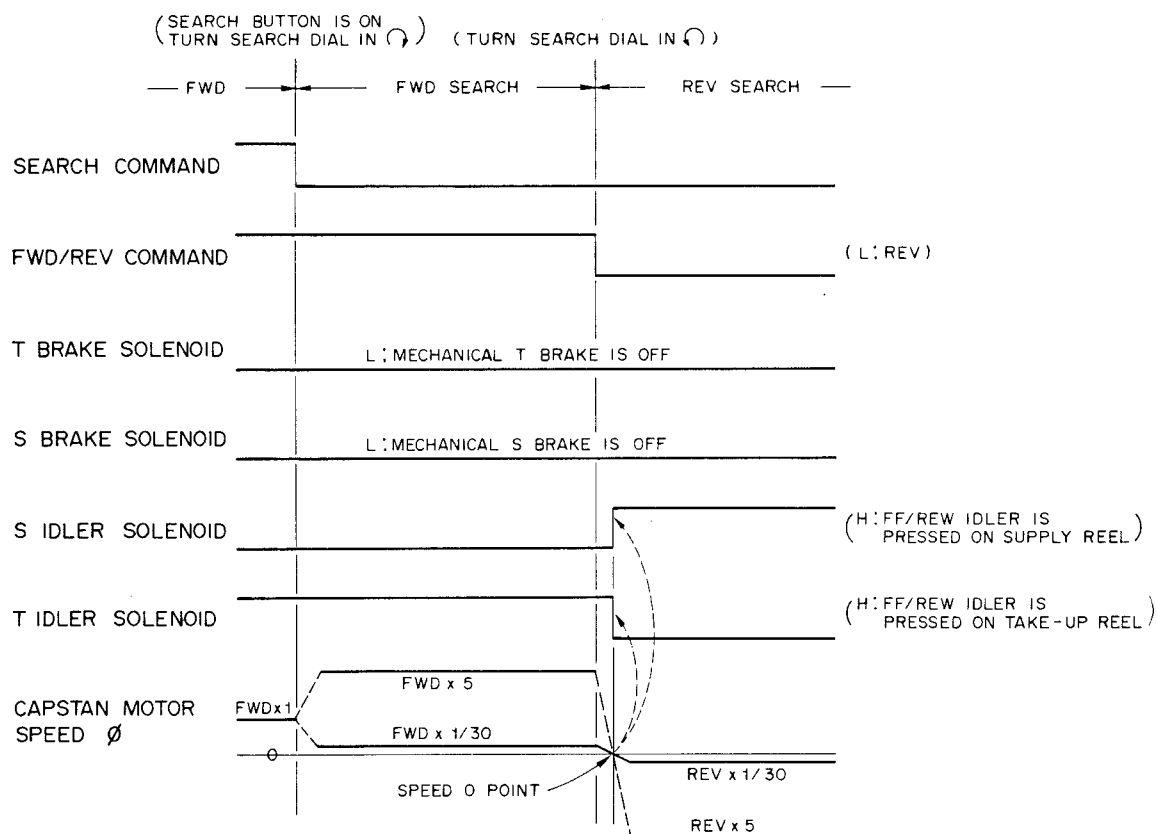
• FR-STOP → FWD → FWD/PAUSE



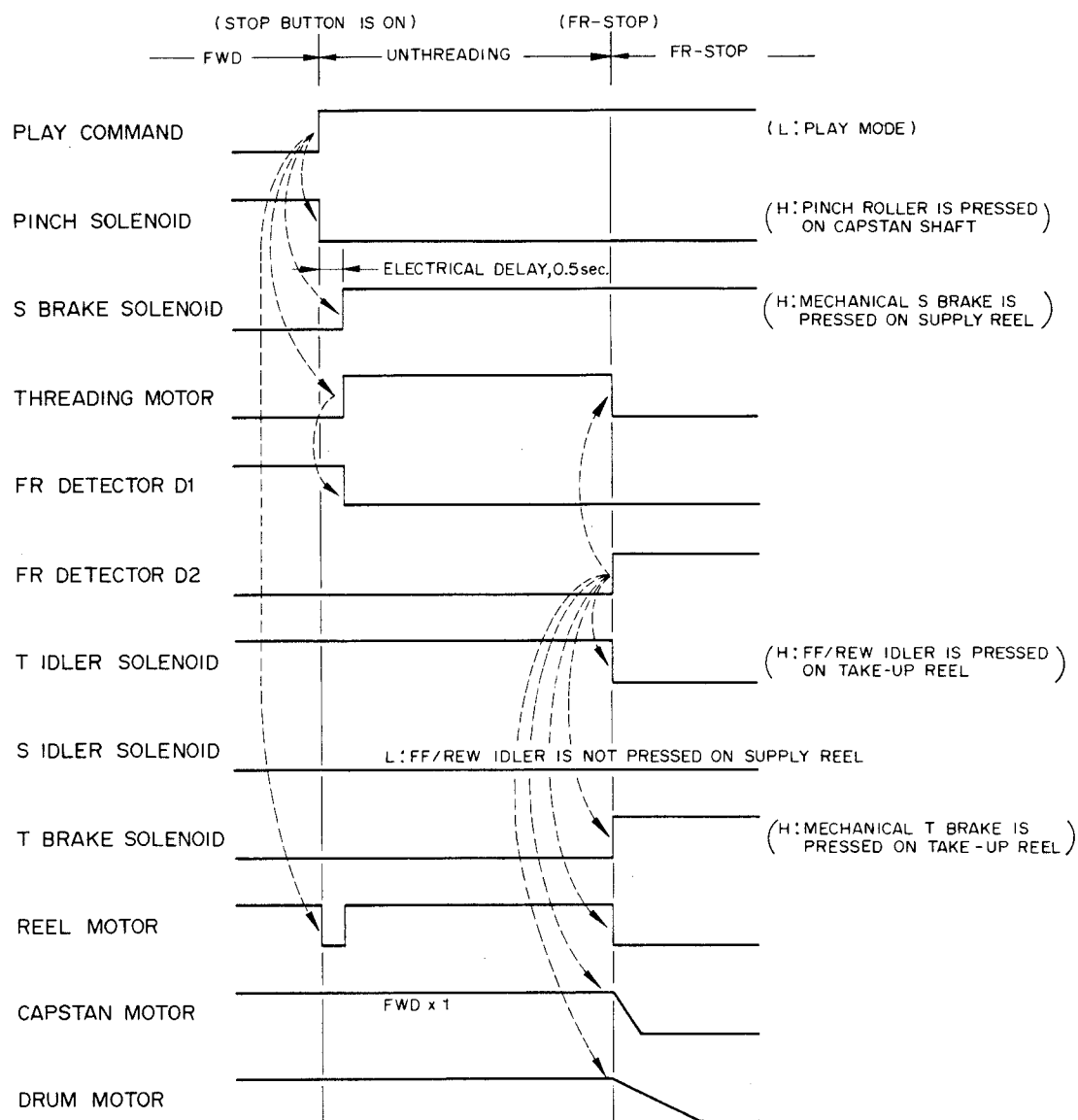
• FR-STOP → REC → REC/PAUSE



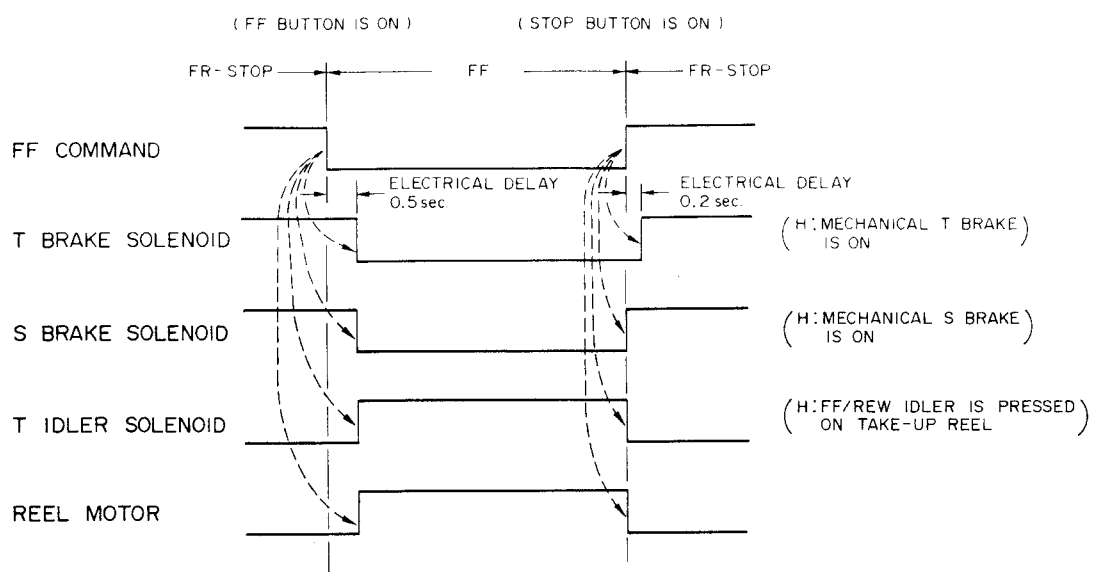
• FWD → FWD SEARCH → REV SEARCH



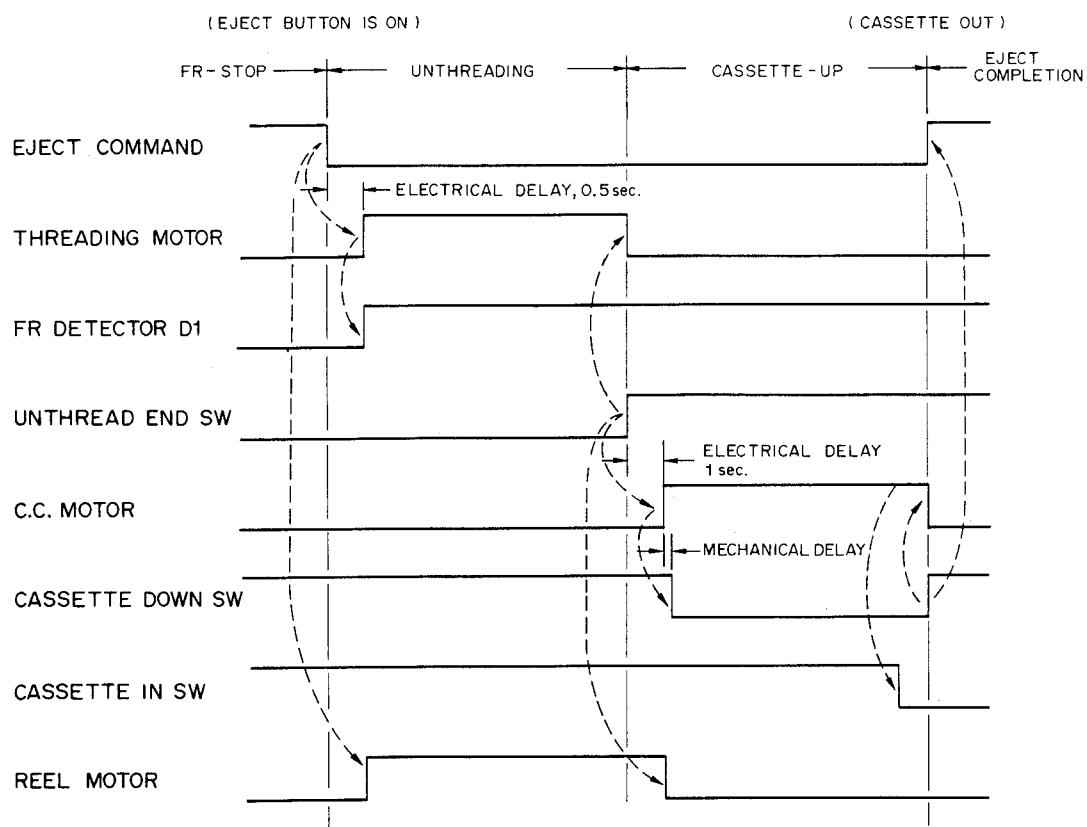
• FWD → FR-STOP



• FR-STOP → FF → FR-STOP



• FR-STOP → EJECT COMPLETION



SECTION 3

PERIODIC CHECK AND MAINTENANCE

It is recommended to perform the maintenance and the periodic check mentioned below for the best operation of the function and performance of the machine and for prolonging the lives of the machine and the tape.

3-1. MAINTENANCE AFTER REPAIRS

Perform the following maintenance after the repair without regarding the operating hours of the machine.

- (1) **Cleaning of video heads and rotary erase heads**
 - Press the cleaning piece moistured with the cleaning fluid and turn the drum slowly with the hand, cleaning the heads. (Never turn the motor by the electric power for the cleaning.)
 - Never move the cleaning piece in the vertical direction of the head tip in the cleaning. It tends to damage the head tips.
- (2) **Cleaning of tape running system**
 - Wipe the tape bearing surfaces (of the tape guide, drum, capstan, and pinch roller) with cleaning piece saturated with the cleaning fluid.
- (3) **Cleaning of drive system**
 - Wipe the drive system (such as belt, idler, and reel table surface) with cleaning piece saturated with the cleaning fluid.

3-2. PERIODIC CHECK

Perform the maintenance checks described separately in accordance with the operational hours of the machine.

3-3. HOURS METER

The VO-5850 has an hours meter on the ML-1 board for the periodic check and the maintenance. The hours meter accumulates and records the elapsed time of all the modes in which the drum rotates while the tape is threaded. It is recommended that the hours meter is used as a tool for determining the periodic check. When the hours meter indicates the maximum value, 1000 hours, the hours meter must be replaced with a new one.
(SONY Part No.: 1-548-119-00)

3-4. OTHERS

- (1) **SONY oil**
 - Be sure to use the SONY oil as the lubrication oil. (If oil other than the SONY oil is used, various troubles due to a different viscosity tends to be caused.)
SONY oil: Part No. 7-661-018-01
 - Use the SONY oil in which dust or other foreign material have not mixed for lubricating the bearing. (If foreign material is in the oil, wear or burning of the bearing tends to be caused.)
- (2) **Grease**

Be sure to use the following grease.
SONY grease: Part No. 7-662-001-62 (SGL-501)
- (3) **Regarding overhaul of equipment**

When overhaul of an equipment is attempted, replace parts referring list. For the parts not listed in the list, such as motors and heads, refer the following items.

Reel motor;	about 3,000H
Capstan motor;	about H
Threading motor;	about H
Cassette-up compartment motor;	about H
Audio/CTL head;	about 3,000H
CTL/Erase head;	about H

CHECK AND MAINTENANCE

■ : apply oil ○ : cleaning ◆ : replace ◇ : check ⊙ : apply a grease

Item	Part No. of Replacement Parts	Operating Hours (H)										Remarks
		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	
Tape path cleaning	—	○	○	○	○	○	○	○	○	○	○	Perform whenever repair work is attempted
Video heads cleaning and replace	A-6709-102-A	○	◆	○	◆	○	◆	○	◆	○	◆	Life of the video heads are affected extensively by operating ambient conditions
Replacement of pinch roller	A-6750-125-A	○	◆	○	◆	○	◆	○	◆	○	◆	Life of the pinch roller are affected extensively by operating systems
Replacement of FF/REW idler belt	3-668-785-00	○	○	○	◆	○	○	○	◆	○	○	
Replacement of reel table	A-6739-016-A	○	■	○	◆	○	■	○	◆	○	■	
Replacement of R brake shoe	X-3668-737-0	—	—	—	◆	—	—	—	◆	—	—	
Replacement of brake band	X-3668-707-0	—	—	—	◆	—	—	—	◆	—	—	
Replacement of brush	A-6709-360-A or 3-607-104-00	—	—	—	—	—	◆	—	—	—	—	
Replacement of belt on gear box	3-668-946-00	○	○	○	○	○	○	○	◆	○	○	
Replacement of belt on cassette-up compartment	3-653-387-00	○	○	○	○	○	○	○	◆	○	○	
Cleaning the shaft of the threading roller on the threading ring	—	—	○	—	○	—	○	—	○	—	○	Clean with a cloth dampened with a cleaning fluid
Apply a grease on the ring rollers	—	—	⊙	—	⊙	—	⊙	—	⊙	—	⊙	Apply a grease on the surface of the ring roller
Check the FWD back tension	—	—	◇	—	◇	—	◇	—	◇	—	◇	Refer to sec. 6-6
Check the FWD torque	—	—	◇	—	◇	—	◇	—	◇	—	◇	Refer to sec. 6-3
Check the REV torque	—	—	◇	—	◇	—	◇	—	◇	—	◇	Refer to sec. 6-4
Check the brake torque	—	—	—	—	◇	—	—	—	◇	—	—	Refer to sec. 6-1

SECTION 4

REPLACEMENT OF MAJOR PARTS

4-1. REPLACEMENT OF UPPER DRUM ASSEMBLY

- The rotary video and erase heads cannot be replaced individually; the whole upper drum assembly must be replaced when any one of these heads fails.

Tool:

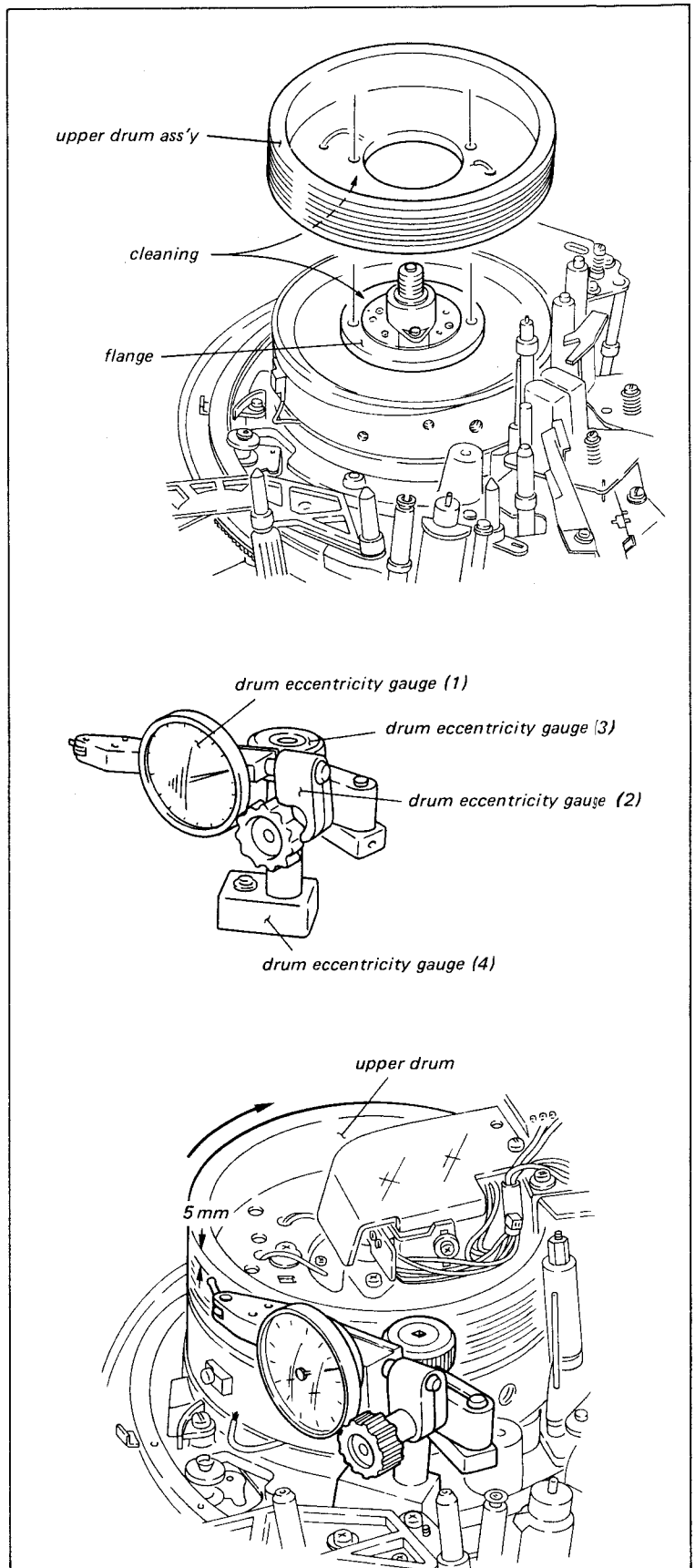
- Drum eccentricity gauge (1)
- Drum eccentricity gauge (2)
- Drum eccentricity gauge (3)
- Drum eccentricity gauge (4)
- Cleaning fluid

Replacement procedure:

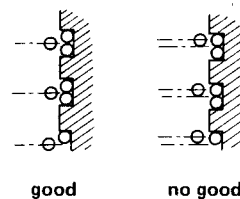
- (1) Remove the slip-ring block.
- (2) Unsolder the eight leads of the video head and rotary erase heads from the printed circuit board and remove the upper drum assembly from the head drum assembly.
- (3) Clean the matching surfaces of the flange and new upper drum assembly with a cloth moistened with cleaning fluid. (If there is a spacer between drum and flange, it should remain in place, or be re-installed in the same place with the new upper drum assembly.)
- (4) Place the upper drum assembly so that the head of the white leads is close to the round indentation on the surface of the flange. (The rounded indentation can be seen through the hole in the end of the printed circuit board the white leads are connected to). Thread the two screws snugly but do not tighten.

Adjustment procedure:

- (1) Remove the S guard block (Because the S guard's bottom connector is inserted into the connector on the chassis, it needs the power to remove.)
- (2) Assemble the drum eccentricity gauges (1), (2), (3) and (4) as shown in figure. Mount the assembled gauges on the machine so that the tip probe positions at the point about 5 mm apart from the top edge of the upper drum.
- (3) Turn the upper drum slowly clockwise and confirm the pointer deflection of the gauge is within 5μ during one complete turn of the upper drum. If this specification is satisfied, proceed with step (5). If it is not, perform step (4).
- (4) Tap the inside of the upper drum with a nylon hammer or a screwdriver handle and like so that the gauge deflection remains within 5μ .
- (5) After the adjustment, tighten the two screws that are securing the upper drum, alternately and gradually using a tightening torque: $14 \sim 16 \text{ kg.cm}$.



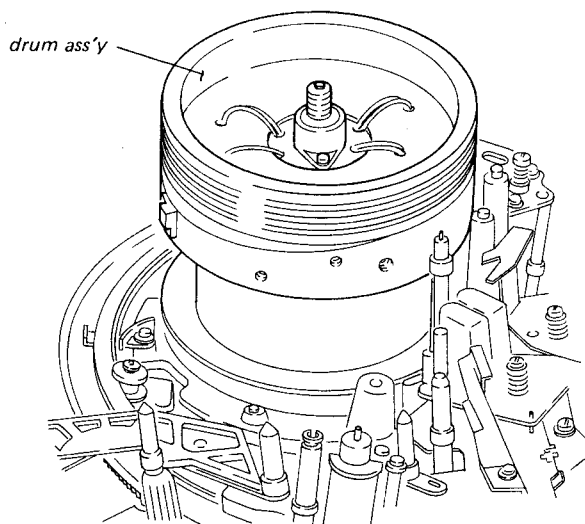
- (6) After the screws are tightened, check again that the eccentricity of the upper drum is within 5μ .
- (7) Solder the eight leads from the video and rotary erase heads to the printed circuit board.
- (8) Install the slip-ring block. (The positional relationship of the slip-ring and the brush must be as shown in the figure.)
- (9) Install the S guard block.
- (10) Perform the various adjustments as shown in page 4-7.



4-2. REPLACEMENT OF DRUM ASSEMBLY

Replacement procedure:

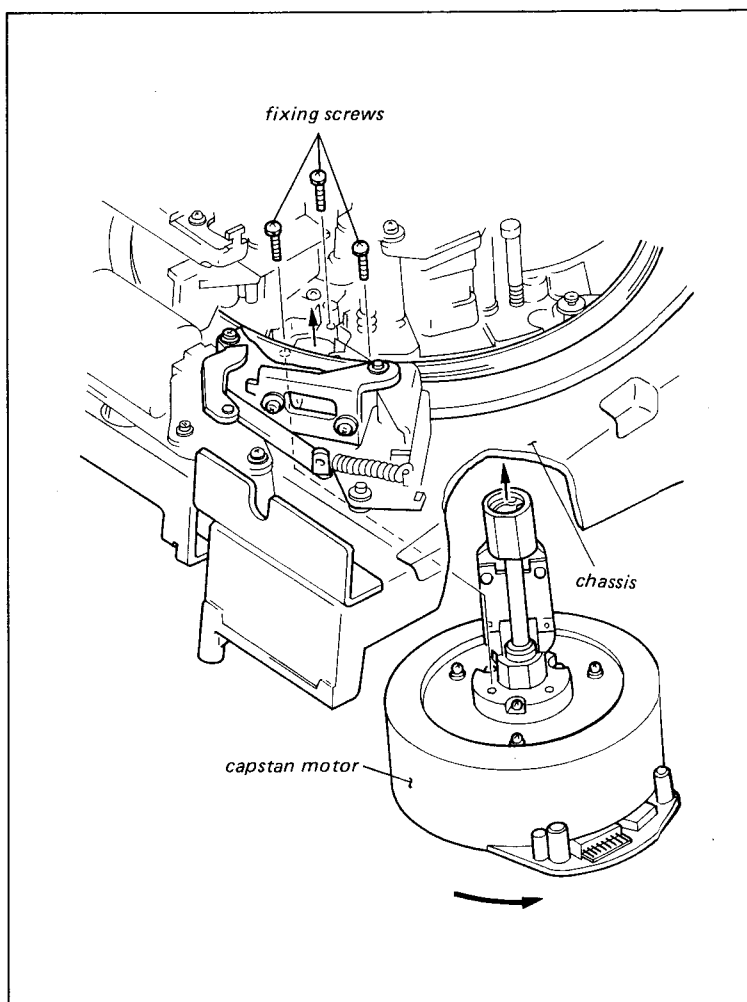
- (1) Remove the brush assembly.
- (2) Disconnect the connectors (CN1 and CN2) of the drum assembly and CN6 on the MP-12 board.
- (3) Remove the three fixing screws on the back of the chassis and remove the defective drum.
- (4) Install the drum on the base while turning the drum assembly in the clockwise direction as seen from top of the set.
- (5) Connect the three connectors.
- (6) Install the brush assembly.
- (7) Perform the various adjustments as shown in page 4-7.



4-3. REPLACEMENT OF CAPSTAN MOTOR

Replacement procedure:

- (1) Remove the capstan motor.
- (2) Install the new capstan motor and thread three fixing screws snugly but do not tighten.
- (3) While turning the capstan motor in the counterclockwise direction as seen from top of the set and tighten the fixing screws.

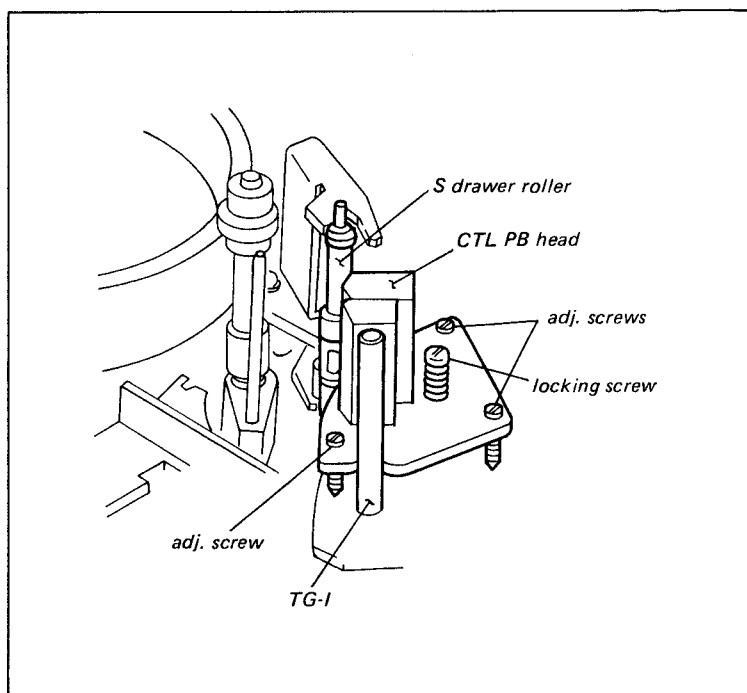


REPLACEMENT

4-4. REPLACEMENT OF CTL PB HEAD

Replacement procedure:

- (1) Remove the locking screw and remove the CTL PB head from the chassis. Do not tighten or loosen three adjusting screws.
- (2) Loosen the two fixing screws under the bracket and replace the CTL PB head.



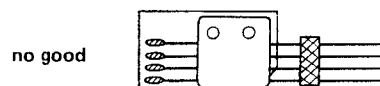
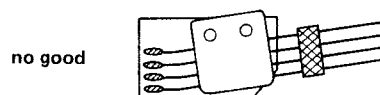
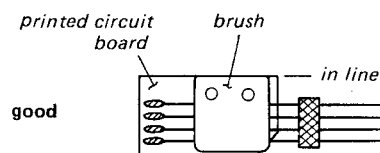
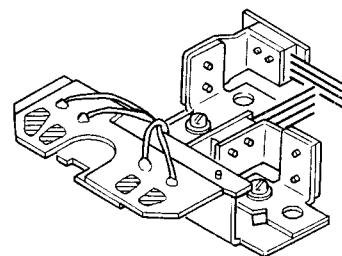
4-5. REPLACEMENT OF BRUSH

- Spare parts of brush is prepared as the following types.
 (1) Brush assembly as shown in figure.
 (2) Single part of the brush.

Replacement procedure of the single part is described here. It is necessary to perform the brush height adjustment and brush position adjustment in any type of spare parts.

Replacement procedure:

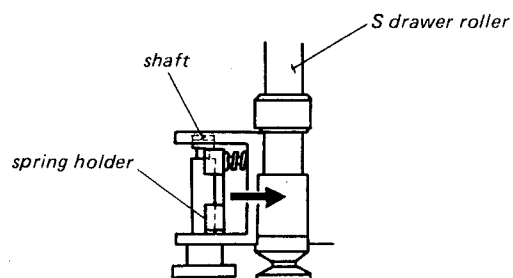
- (1) Remove the brush and solder the new brush to the printed circuit board so that the edge of the brush and the printed circuit board are in the same plane.
- (2) Install the assembled brush on the brush bracket.
- (3) Perform sec. 5-10 brush position adjustment.

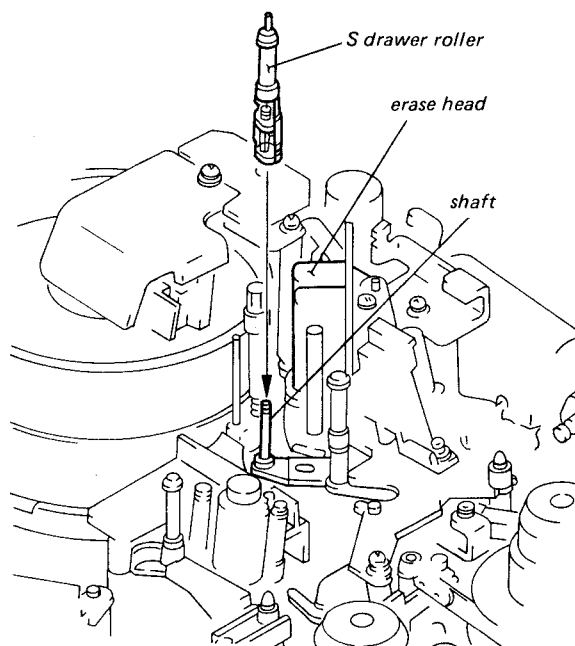


4-6. REPLACEMENT OF S DRAWER ROLLER

Replacement procedure:

- (1) Put the machine into the EJECT completion mode without cassette tape.
- (2) Turn the pulley of the gear box with finger until the S drawer roller places in front of the CTL PB head.
- (3) Remove the S drawer roller from the shaft while pushing the spring holder in the arrow direction.
- (4) Install the new S drawer roller into the shaft until the S drawer roller lockes to the shaft while pushing the spring holder in the arrow direction.





4-7. REPLACEMENT/ADJUSTMENT OF TAPE GUIDES ON THREADING RING

Tool and equipment:

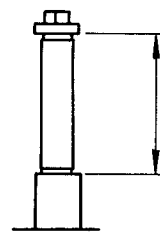
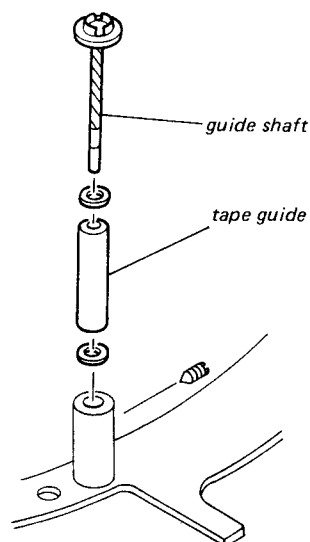
Slide vernier calliper or the equivalent.
Cleaning fluid.

Replacement procedure:

- (1) Remove the tape guide.
- (2) Clean the surface of the shaft with a cloth dampened with a cleaning fluid.
- (3) Assemble the parts.
- (4) The sub-ring upper tape guide and lower tape guide are necessary to perform the guide width adjustment.

Adjustment procedure:

- (1) Adjust the tape guide width to meet the required specification.



Spec.:
19.4 mm ~ 19.5 mm

4-8. REPLACEMENT OF CX-194A

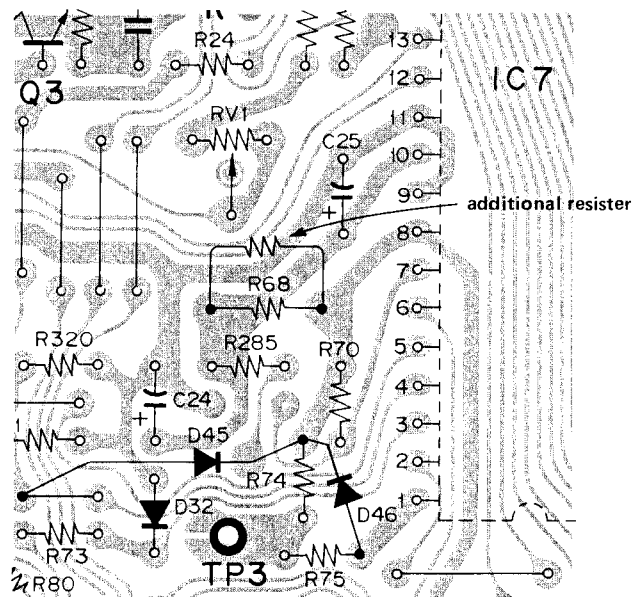
- When the CX-194A (servo IC) is replaced, it is necessary to perform the following check and adjustment to prevent the jitter.

Tool and equipment:

Digital volt meter.

Check and adjustment procedures:

- Mount the CX-194A, and check the dc voltage at IC7 pin 10.
- Select the carbon resistor corresponding to the dc voltage in step (1). Solder the resistor as shown in figure.



(SV-31)

dc level	additional resistor	part number
more than 4.9 V	non	—
4.8 V	2 k Ω , ¼W, Carbon	1-246-480-00
4.7 V	1.5 k Ω , ¼W, Carbon	1-246-477-00
4.6 V	1 k Ω , ¼W, Carbon	1-246-473-00
4.5 V	680 Ω , ¼W, Carbon	1-246-469-00
4.4 V	510 Ω , ¼W, Carbon	1-246-466-00
4.3 V	430 Ω , ½W, Carbon	1-244-864-00
4.2 V	330 Ω , ½W, Carbon	1-244-861-00
4.1 V	270 Ω , ½W, Carbon	1-244-859-00
4.0 V	200 Ω , ½W, Carbon	1-244-856-00
3.9 V	160 Ω , ½W, Carbon	1-244-854-00

4-9. ADJUSTMENT ITEM TABLE AFTER MAIN PARTS REPLACEMENT

Replacement Parts	Adjustment Items
• Threading Ring	Threading Ring Rotation Adjustment (5-3-1) → Gear Box Position Adjustment (5-3-2) → FR Detector Block (5-3-4) Mounting Position Adjustment (5-3-3) → Pinch Roller Self-Alignment Adjustment (5-4-2) → Pinch Lever Pre-set Adjustment (5-4-1) → Pinch Roller Pre-set Adjustment (5-4-2) → FF and REW Modes Tape Path Adjustment (7-1) → T Correction Guide Slantness Adjustment (7-2) → Tape Path Adjustment Around Pinch Roller (7-6, (7-6-1, 7-6-2)) → FWD Mode Tape Path Adjustment (1) (7-3) → FWD Mode Tape Path Adjustment (2) (7-4) → REV Mode Tape Path Adjustment (7-5) → 10 Times Picture Search Mode Tape Path Adjustment (7-7) → Video Tracking Adjustment (7-8-1) → CTL. PB Head Height/Azimuth/Zenith Adjustment (7-8-2) → Video Tracking Adjustment (check). (7-8-1)
• Pinch Roller	Pinch Roller Self-Alignment Adjustment (5-3-3) → Pinch Roller Pre-set Adjustment (5-4-2) → FWD Mode Tape Path Adjustment (2) (7-4) → REV Mode Tape Path Adjustment (7-5) → Tape Path Adjustment Around Pinch Roller (7-6, (7-6-1, 7-6-2)) → 10 Times Picture Search Mode Tape Path Adjustment (7-7) → Video Tracking Adjustment (check). (7-8-1)
• Take-up Reel Table	Reel Table Height and Vertical Play Adjustment (5-1-2) → T Brake Torque Adjustment (6-1-2) → REW Brake Torque Adjustment (6-1-3) → FF and REW Torque Adjustment (6-2) → FWD Torque Adjustment (6-3) → FF and REW Tape Path Adjustment. (7-1)
• Supply Reel Table	Reel Table Height and Vertical Play Adjustment (5-1-2) → S Brake Torque Adjustment (6-1-1) → FF and REW Torque Adjustment (6-4) → REV Torque Adjustment (6-5) → FF Back Tension Adjustment (6-6) → FWD Back Tension Adjustment (6-6) → Video Tracking Adjustment (check). (7-8-1)
• Brake Band	FF Back Tension Adjustment (6-5) → FWD Back Tension Adjustment. (6-6)
• Capstan Motor	Pinch Lever Right Angle Adjustment (5-4-4) → Pinch Roller Self-Alignment Adjustment (5-3-3) → Capstan SEARCH ×1 Speed Adjustment (9-4) → Capstan SEARCH ×1/30 Speed Adjustment (9-5) → Capstan SEARCH ×1/15 Speed Adjustment (9-6) → Capstan SEARCH ×1/2 Speed Adjustment (9-9) FWD and REV Detector Adjustment (9-10) → Capstan Free Speed Adjustment (9-11) → Capstan STOP Servo Adjustment (9-11) → FWD Mode Tape Path Adjustment (2) (7-4) → REV Mode Tape Path Adjustment (7-5) → Tape Path Adjustment Around Pinch Roller (7-6, (7-6-1, 7-6-2)) → 10 Times Picture Search Mode Tape Path Adjustment (7-7) → Video Tracking Adjustment (check). (7-8-1)
• Threading Motor	Gear Box Position Adjustment. (5-3-2)
• Reel Motor	FWD Torque Adjustment (6-3) → REV Torque Adjustment (6-4) → 10 Times Picture Search Mode Speed Adjustment (9-15-1) → Still Speed Adjustment. (9-15-2)

Replacement Parts	Adjustment Items
• CTL. PB Head	CTL. PB Head Height/Azimuth/Zenith Adjustment (7-8-2) → Tracking Adjustment (check). (7-8-1)
• Audio/CTL Head	Audio Head Height Adjustment (7-8-3) → Audio Head Azimuth Adjustment (7-8-5) → Video Tracking (7-8-1) Adjustment → Audio Head Height Adjustment (7-8-3) → Audio Head Azimuth Adjustment (7-8-5) → Audio Head Phase Adjustment (7-8-6) → Audio/CTL Head Position Adjustment (7-8-7) → Audio System Alignment. (10-1 ~ 10-12)
• Drum Assembly	Brush Position Adjustment (5-10) → Tracking Adjustment (7-8, (7-8-1 ~ 7-8-7)) → FF and REW Tape Path Adjustment (7-1) → FWD Mode Tape Path Adjustment (2) (7-4) → REV Mode Tape Path Adjustment (7-5) → Video Head Dihedral Adjustment (7-9) Head Dihedral Adjustment → Drum AFC Bias Adjustment (9-7) → Drum AFC Transient Adjustment (9-8) → Drum ϕ^2 Adjustment (9-12) → Switching Position Adjustment (9-13) → Picture Splitting (9-14) Compensator Adjustment.
• Upper Drum Assembly	Upper Drum and Eccentricity Adjustment (4-1) → Brush Position Adjustment (5-10) → Tracking Adjustment (7-8, (7-8-1 ~ 7-8-7)) → FF and REW Tape Path Adjustment (7-1) → FWD Mode Tape Path Adjustment (2) (7-4) → REV Mode Tape Path Adjustment (7-5) → Video Head Dihedral Adjustment (7-9) → PB RF Amplifier Adjustment (11-1, (11-1-1 ~ 11-1-7)) → Record Amplifier Adjustment. (11-6, (11-6-1 ~ 11-6-3))

SECTION 5

LINK AND DRIVE SYSTEM ALIGNMENT

5-1. REEL TABLE SYSTEM ADJUSTMENT

5-1-1. Cassette Holder Position Adjustment

Tool and equipment:

Reel table height check base jig.
Thickness gauge.

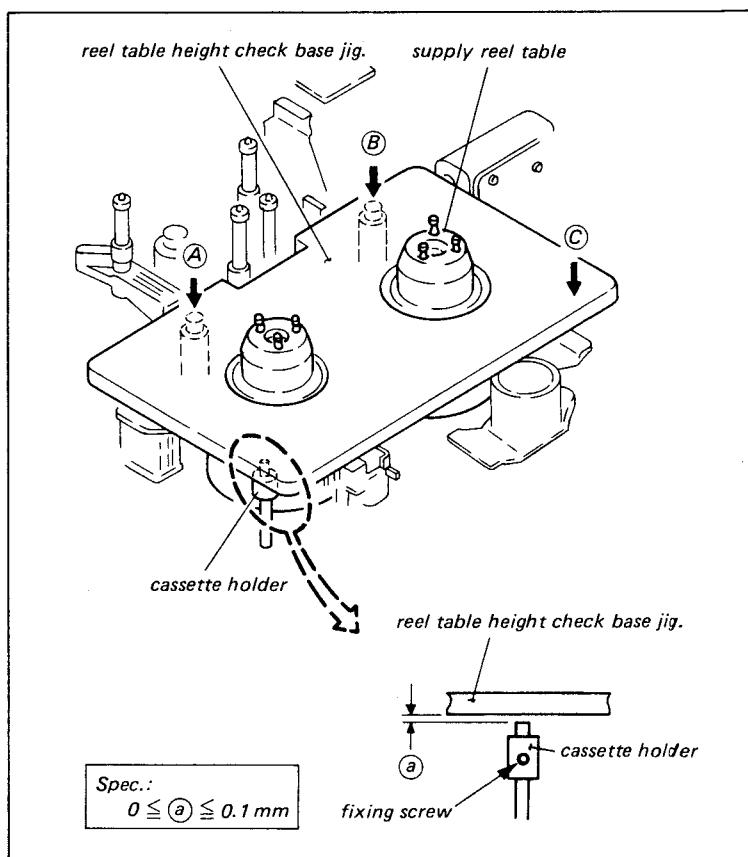
Mode: EJECT completion

Check procedure:

Check that the clearance between the base jig and the cassette holder meets the required specification while pushing lightly the reel table height check base jig marked (A), (B) and (C) toward the chassis.

Adjustment procedure:

Adjust the position of the cassette holder so that meets the required specification.



5-1-2. Reel Table Height and Vertical Play Adjustment

- Since the reel table height from the chassis functions as the reference height in the entire tape thread and run system, it is requested that the reel table height adjustment should be attempted carefully, and deliberately.

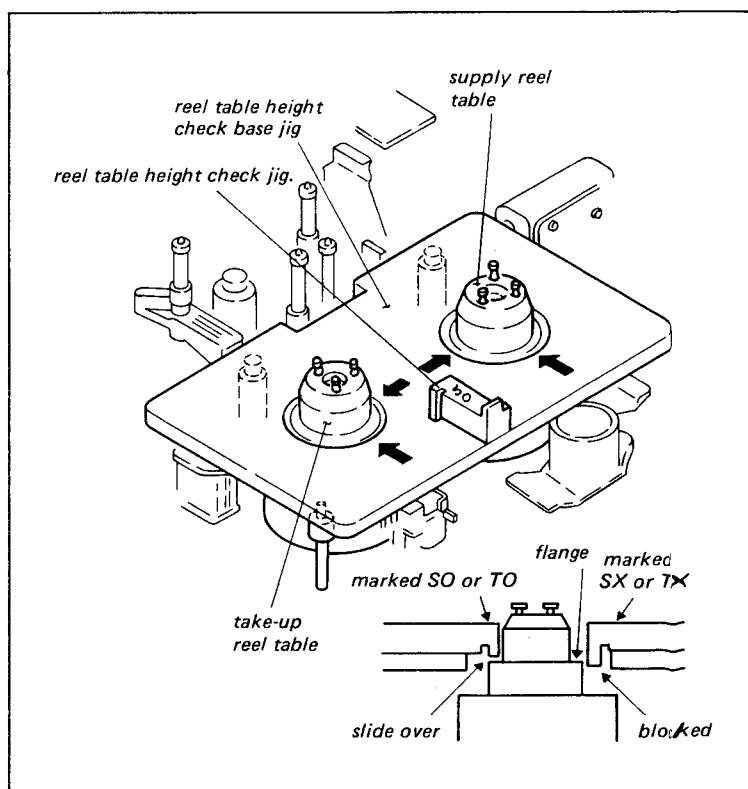
Mode: EJECT completion

Tool and equipment:

Reel table height check base jig.
Reel table height check jig.
Slide vernier callipers or the equivalent.

Check procedure:

- The probes of the reel table height check jig marked "SO" and "TO" can slide over the reel table, leaving a space between the jig and the reel table, while the probes marked "SX" and "TX" are blocked, and cannot slide over reel table.
 - Use the "SO" and "SX" probes for the supply reel table.
 - Use the "TO" and "TX" probes for the take-up reel table.



- (2) Fasten a reel table securing screw, and push up and down the reel table for inspection. Check that the vertical play meets the required specification.

Adjustment procedure:

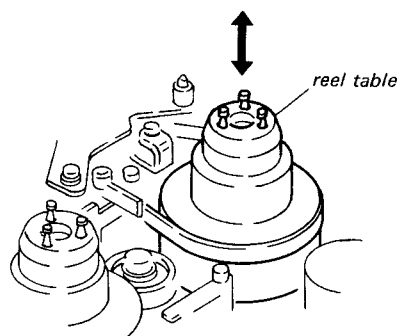
- (1) Adjust height by the washer from under the reel table.
- (2) Adjust vertical play by the washer on top of the reel table.

< NOTE >

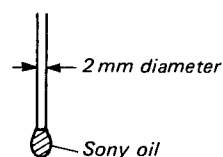
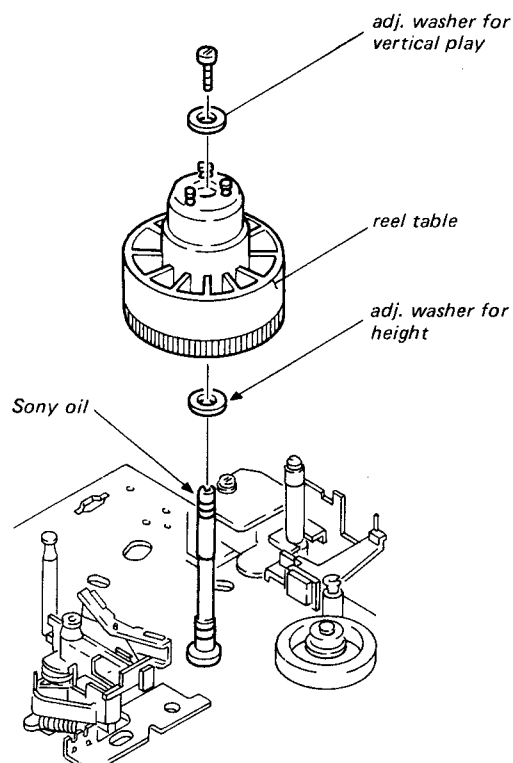
Apply a drop of SONY oil on the reel spindle as shown in figure, whenever the reel table is removed and is adjusted its height with washer.

Amount of oil should be one drop that is scooped by tip of 2 mm diameter twig such as pencil lead.

- 6 mm diameter washer
 - 0.5 mm thick, 3-701-444-21
 - 0.25 mm thick, 3-701-444-11
 - 0.13 mm thick, 3-701-444-01



Spec.:
vertical play
0.17 mm ~ 0.38 mm



5-2. T DRAWER ARM ADJUSTMENT

5-2-1. T Drawer Arm EJECT Position Adjustment

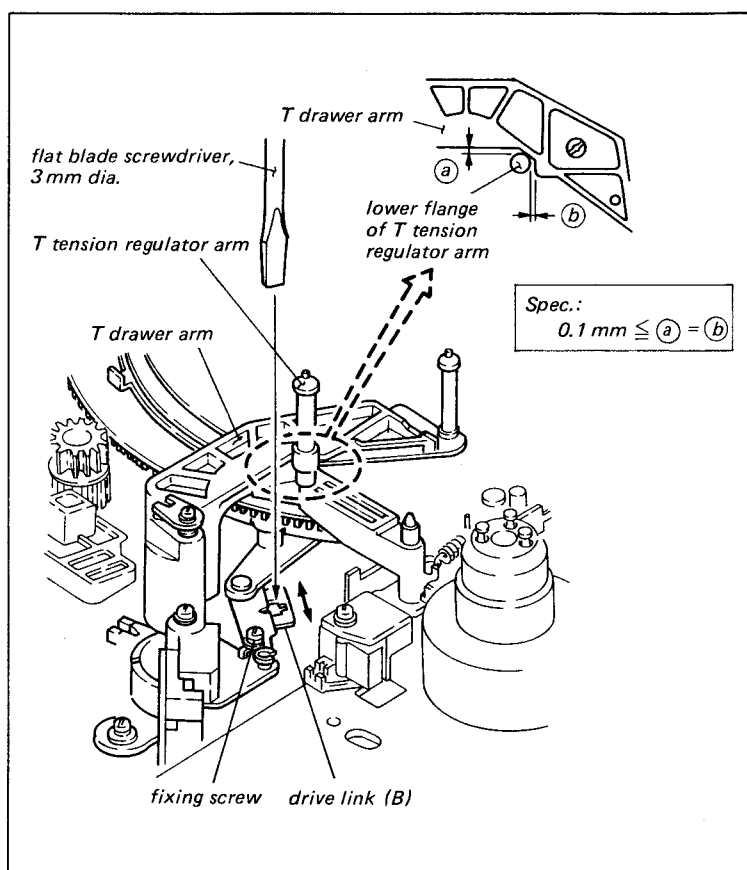
Mode: Setting up FR-STOP mode without cassette tape, and press the EJECT button for setting up EJECT completion state.

Check procedure:

Check that the relationship between the lower flange of T tension regulator arm and the T drawer arm meets the required specification.

Adjustment procedure:

Adjust the position of drive link (B) ass'y by the flat blade screwdriver, 3 mm dia. so that meets the required specification.



5-2-2. Unthread-end Switch Position Adjustment

Tool and equipment:

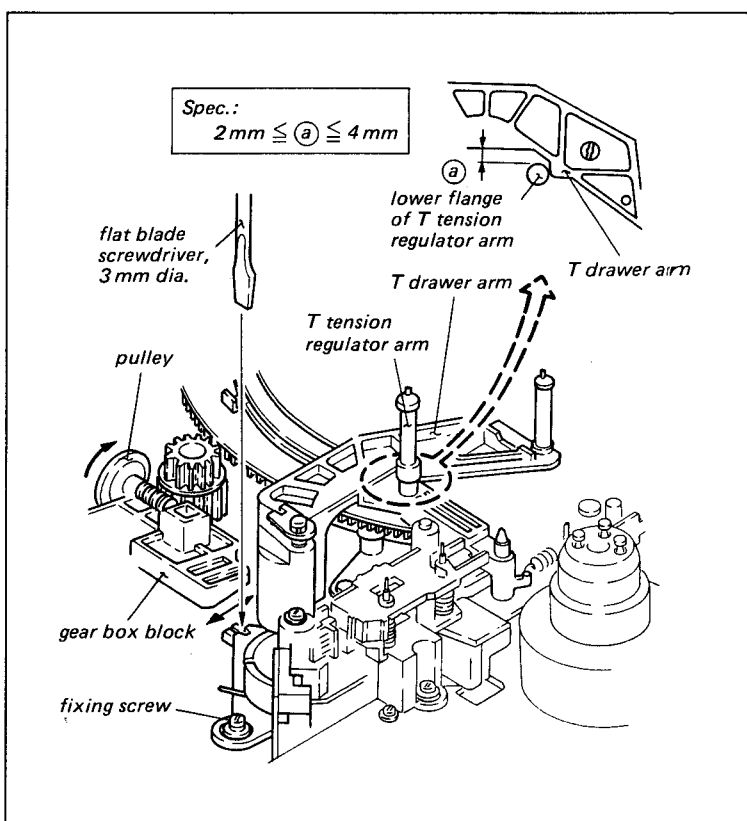
Black colored vinyl tape (1 cm × 1.5 cm)

Preparation:

- (1) Turn the POWER off in the FR-STOP mode.
- (2) Remove the FR detector block, and cover the D2 photo-interrupter (FR-UNTHREAD END Detector) by the black colored vinyl tape. (Put the FR detector in the FR-STOP mode constantly.)

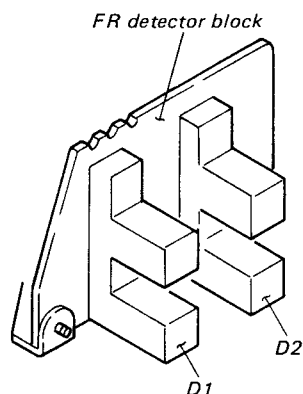
Check procedure:

- (1) Turn POWER on and rotate the pulley of gear box block in the clockwise direction with finger.
- (2) While the relationship of the T drawer arm and the T tension regulator arm is shown in the figure, check that a energized noise of the take-up brake solenoid is heard in this moment.



Adjustment procedure:

- (1) Adjust the position of the photo interrupter holder by the flat blade screwdriver, 3 mm dia. so that meets the required specification.
- (2) Turn POWER off, and mount the FR detector block after peel off the black colored vinyl tape.
- (3) Adjust the FR detector block mounted position. (sec. 5-3-4.)
- (4) Hook the spring on the FR detector block from the pinch lever block.

**5-3. THREADING SYSTEM ADJUSTMENT****5-3-1. Threading Ring Rotation Adjustment**

- This adjustment is required only when the threading ring is replaced or removed.
- If the threading ring is left unadjusted to have narrower clearance, the ring rotation becomes heavy, or if left to have wider clearance, tape run during threading, FWD, REV and 10 times picture search modes will be unstable.

Mode: Check mode; EJECT completion/threading/unthreading
Adjustment mode; EJECT completion

Check procedure:

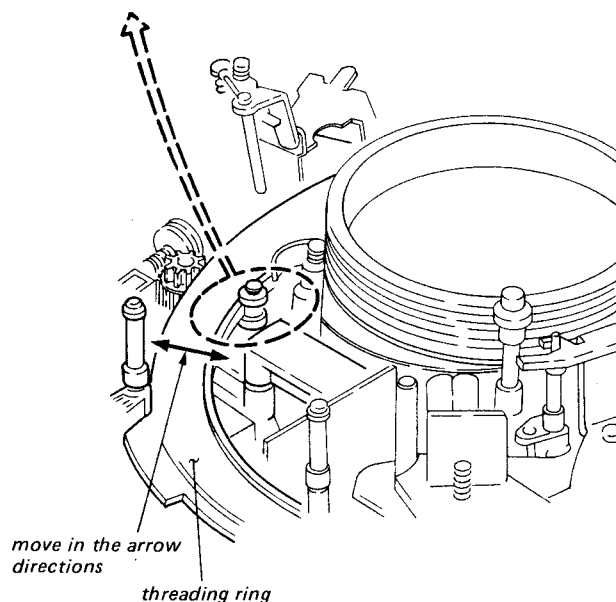
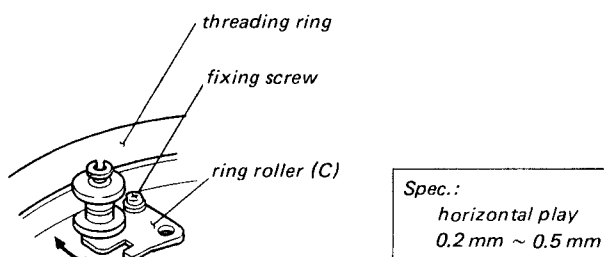
- (1) Check that the horizontal play meets the required specification when the threading ring is pushed in the arrow direction in the EJECT completion mode.
- (2) Check that the rotation of the threading ring into the threading and unthreading modes are smooth.

Adjustment procedure:

- (1) Put the machine into the EJECT completion mode.
- (2) Adjust the position of the ring roller (C) so that meets the required specification.

Adjusting procedure;

- Insert a 0.3 mm thick paper between the threading ring and the ring roller (C).
- Paper of this service manual is 0.1 mm thick so that the three fold becomes 0.3 mm thick.



5-3-2. Gear Box Position Adjustment

- It is required that the sec. 5-3-1 threading ring rotation adj. is checked to be correct or properly adjusted before initiating this adjustment.

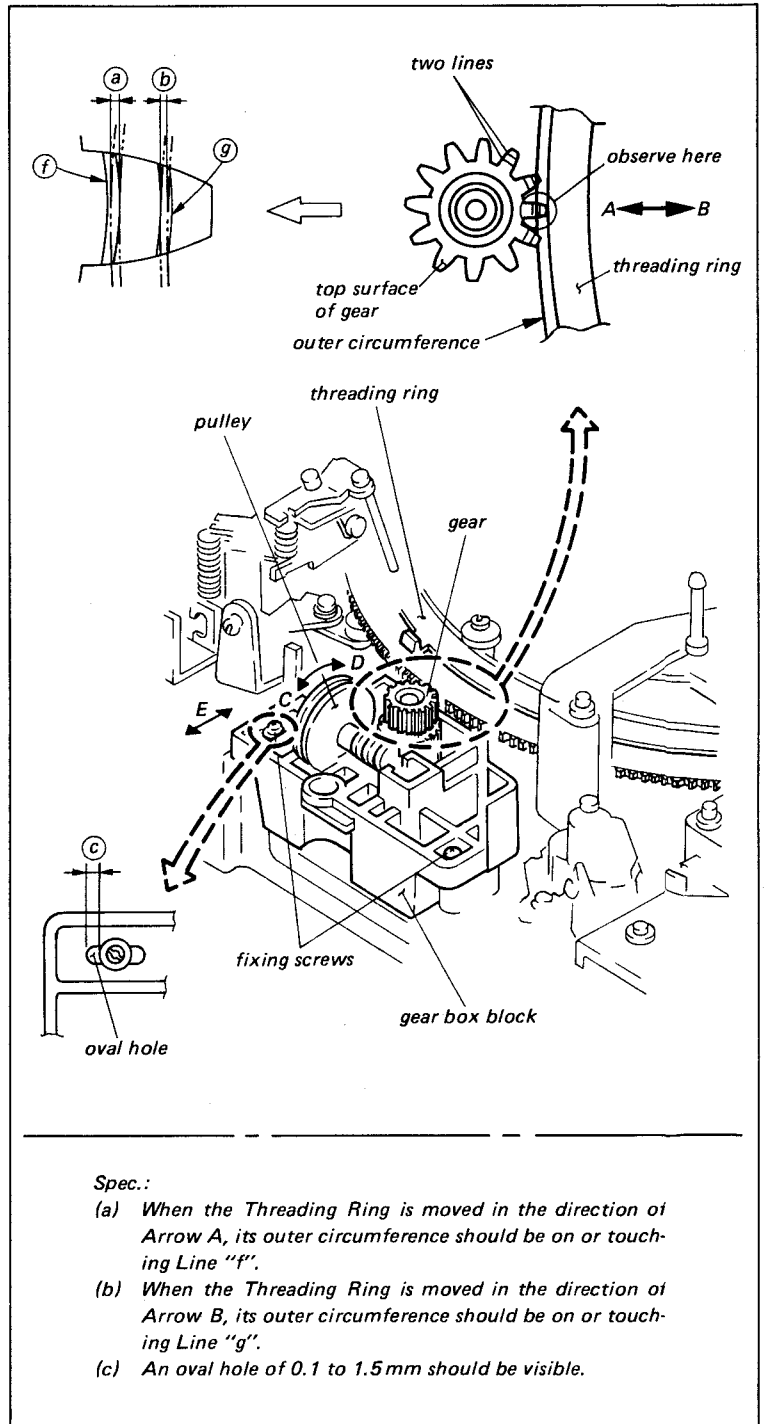
Mode: After completion of EJECT, turn the pulley 1/2 to 1 revolution in the direction of Arrow C in order to push out the Threading.

Check procedure:

- (1) In order to make them easier to see during the Adjustment, mark the two lines on the top surface of the gear with a black felt tip pin.
- (2) Turn the pulley so that one of the lines is roughly parallel to the outer circumference of the Threading Ring.
- (3) Check to be certain that the relationship between the outer circumference of the Threading Ring and the Gear is within the Specifications.

Adjustment procedure:

- (1) With the unit's EJECT completed and the pulley turned 1/2 to 1 revolution (as stated above under MODE), turn the pulley back and forth, as indicated by Arrows C and D, so that the Threading Ring and the Gear engage smoothly.
- (2) Adjust the position of the Gear Box by moving it in the direction indicated by Arrow E until it is within the Specifications.
- (3) Check the sec. 5-3-1 threading ring rotation adj.



5-3-3. Pinch Roller Self-Alignment Adjustment

- If the pinch roller self-alignment is poor, pinch roller's position and inclination against the capstan are erroneous so that the tape will get sear, in the instance of pinch roller's pressing against the capstan.
- Perform the pinch roller pre-set adjustment after this adjustment.

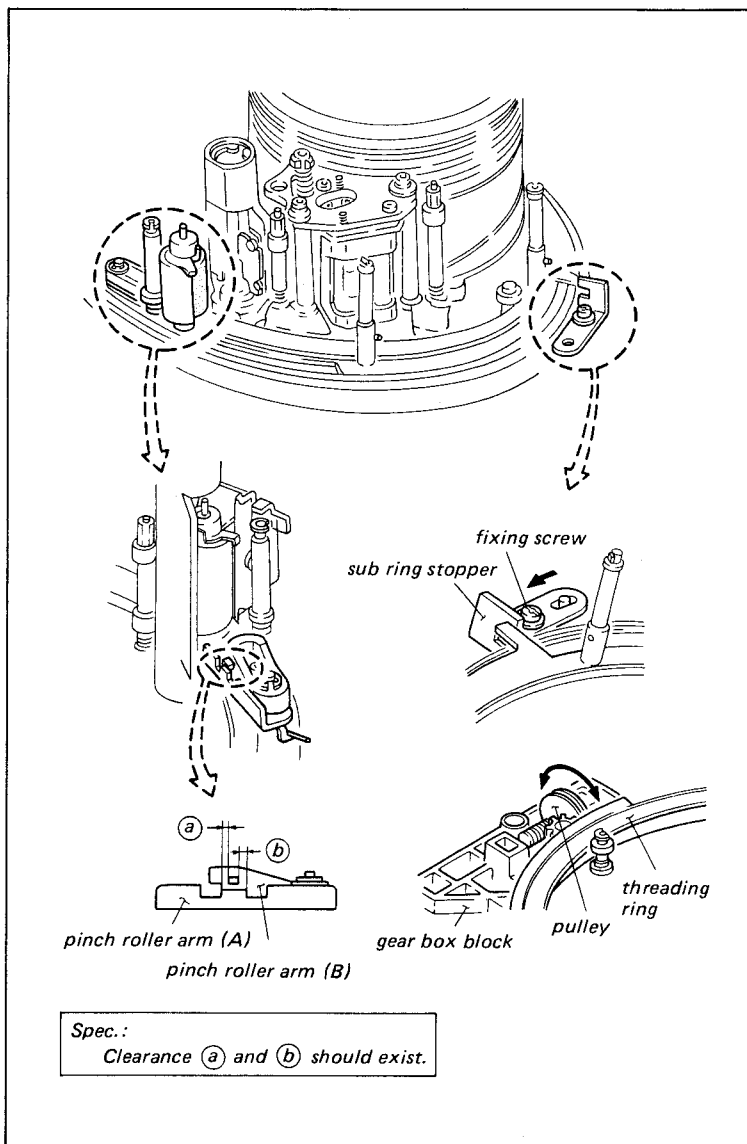
Mode: PLAY

Check procedure:

- (1) Put the machine into PLAY mode without cassette.
- (2) Check that the relationship between the pinch roller arm (A) and (B) meets the required specification.

Adjustment procedure:

- (1) Put the machine into PLAY mode without cassette.
- (2) Loosen the fixing screw of sub ring stopper.
- (3) Turn the pulley of gear box block in the arrow direction with finger.
- (4) Push the sub ring stopper in the arrow direction and tighten the fixing screw.
- (5) Put the machine once into the FR-STOP mode, and confirm as check procedure.



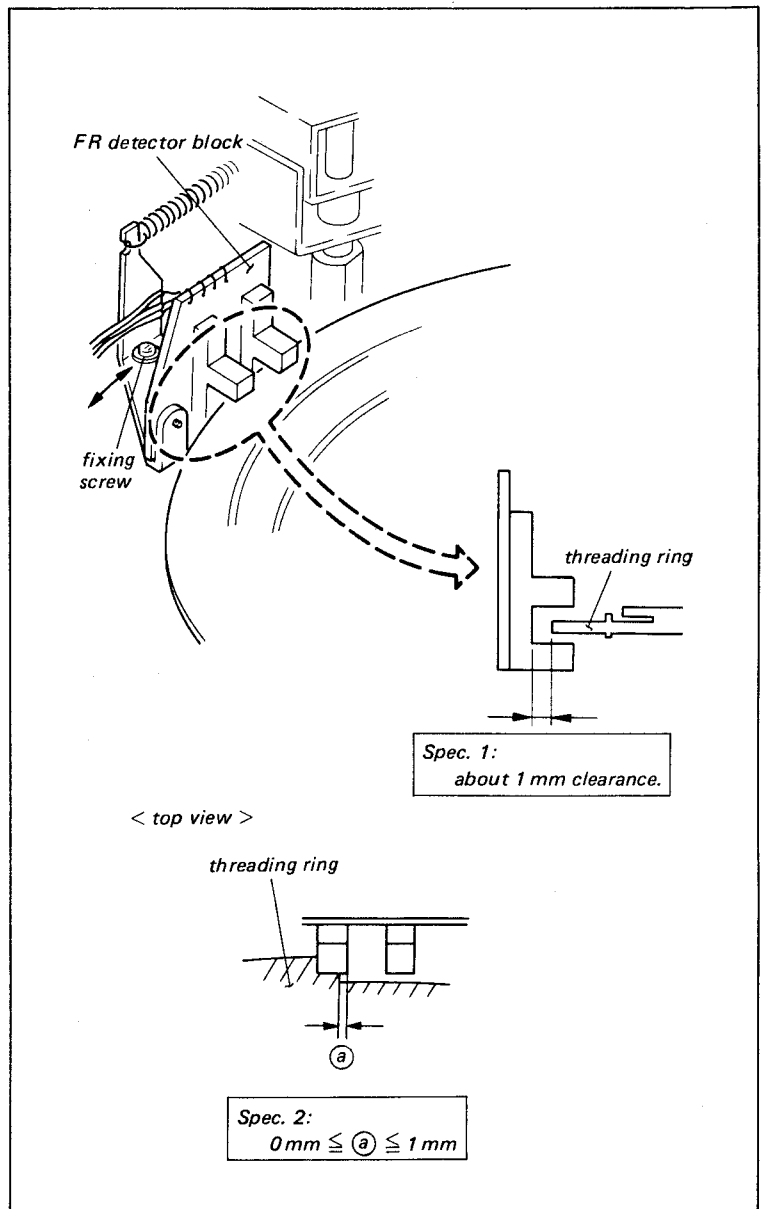
5-3-4. FR Detector Block Mounting Position Adjustment

- It is required that the sec. 5-3-1 threading ring rotation adj. is checked to be correct or properly adjusted before initiating this adjustment.

Mode: Adjustment mode; THREADING completion

Adjustment procedure:

- (1) Put the machine into THREADING completion mode and turn POWER off.
- (2) Press the FR detector block against the threading ring, and then return about 1 mm. (Don't return more than 1.5 mm) (Spec. 1)
- (3) Adjust the position of the FR detector block in the arrow direction so that meets the required specification 2.
- (4) Check that the clearance meets the required specification 1.



5-4. PINCH LEVER BLOCK ADJUSTMENT

5-4-1. Pinch Lever Pre-set Adjustment

- It is required that the threading ring rotation adj. and the pinch roller self-alignment adj. are checked to be correct or properly adjusted before initiating this adjustment.

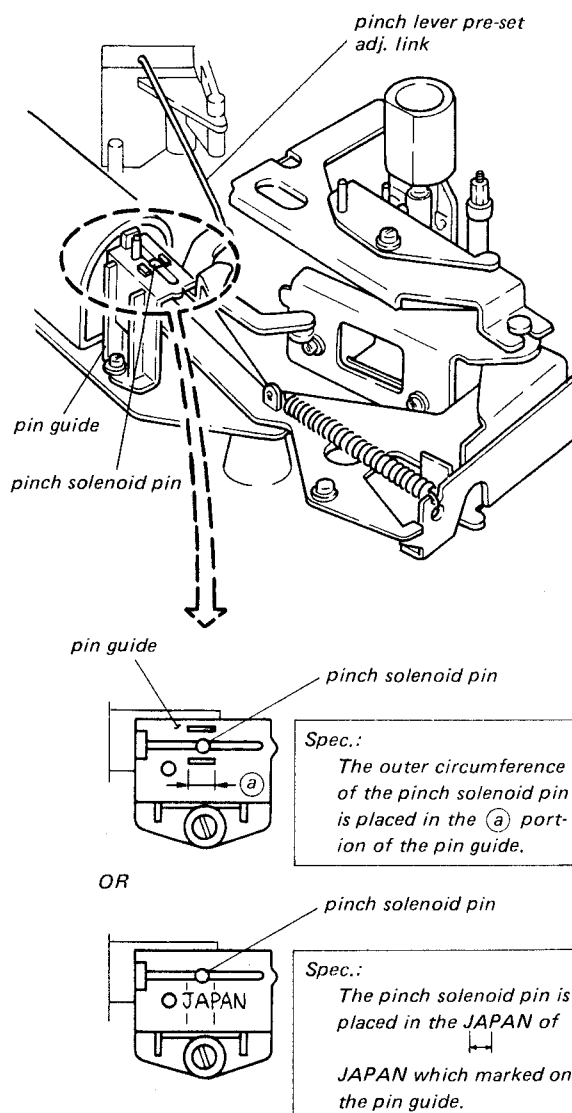
Mode: Turn POWER off in PLAY mode.

Check procedure:

- Turn POWER off in PLAY mode. Check that the position of the pinch solenoid pin meets the required specification.
- Turn POWER on, and press the PLAY button after once unthreading. Check as procedure (1).

Adjustment procedure:

- Adjust the position of pinch solenoid within the specified value, refer to sec. 5-8-5.
- If not in step (1), perform the pinch roller self-alignment adjustment within the specified value, refer to sec. 5-3-3.



5-4-2. Pinch Roller Pre-set Adjustment

- It is required that the threading ring rotation adj. and the pinch roller self-alignment adj. are checked to be correct or properly adjusted before proceeding this adjustment.

Mode: Turn POWER off in PLAY mode.

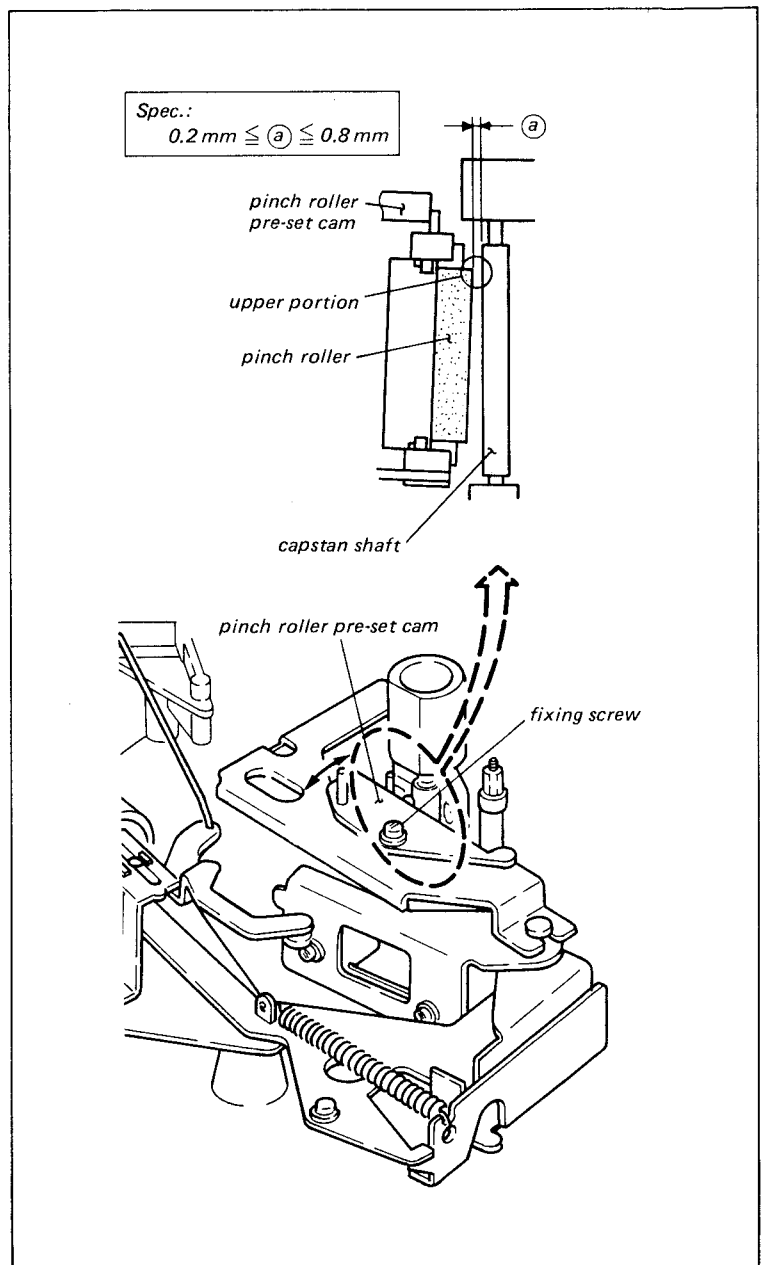
Tool and equipment:
Thickness gauge

Check procedure:

- Turn POWER off in PLAY mode. Check that the clearance between the upper portion of pinch roller and the capstan shaft meets the required specification.
- Turn POWER on, and press the PLAY button after once unthreading. Check as procedure (1).

Adjustment procedure:

- Turn POWER off. Move the position of the pre-set cam in the arrow direction so that meets the required specification.
- Confirm as check procedure in this step.



5-4-3. Pinch Solenoid Block Position Adjustment

Mode: PLAY

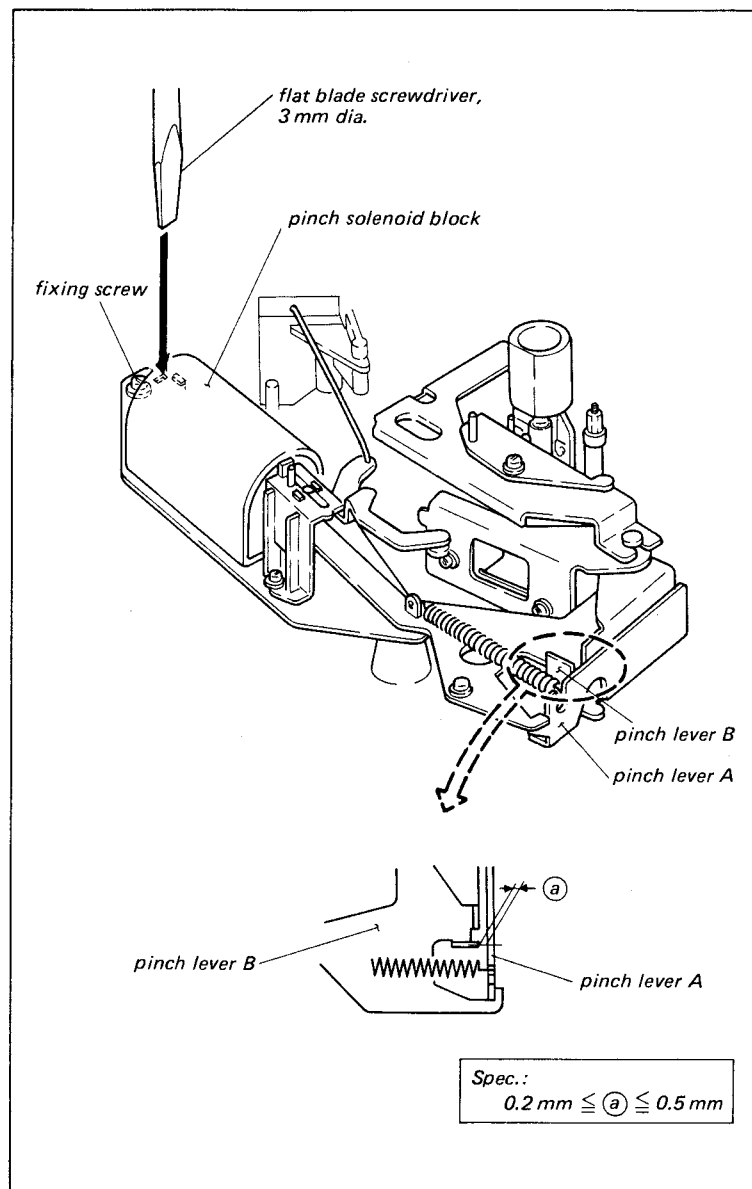
Tool and equipment:
Thickness gauge

Check procedure:

- (1) Thread a tape and put the machine into PLAY mode.
- (2) Check that the clearance between the pinch lever A and B meets the required specification.
- (3) Repeat the unthreading/threading two or three times. Check as procedure (2).

Adjustment procedure:

- (1) Adjust the position of the pinch solenoid block by the flat blade screwdriver, 3 mm dia. in PLAY mode so that meets required specification.
- (2) Confirm as check procedure (2) and (3).



5-5. T TAPE SENSOR POSITION ADJUSTMENT

- There are two adjustments of the height and the clearance between a tape and LED in this section.

Mode: Thread a tape and put the machine into FR-STOP and PAUSE modes.

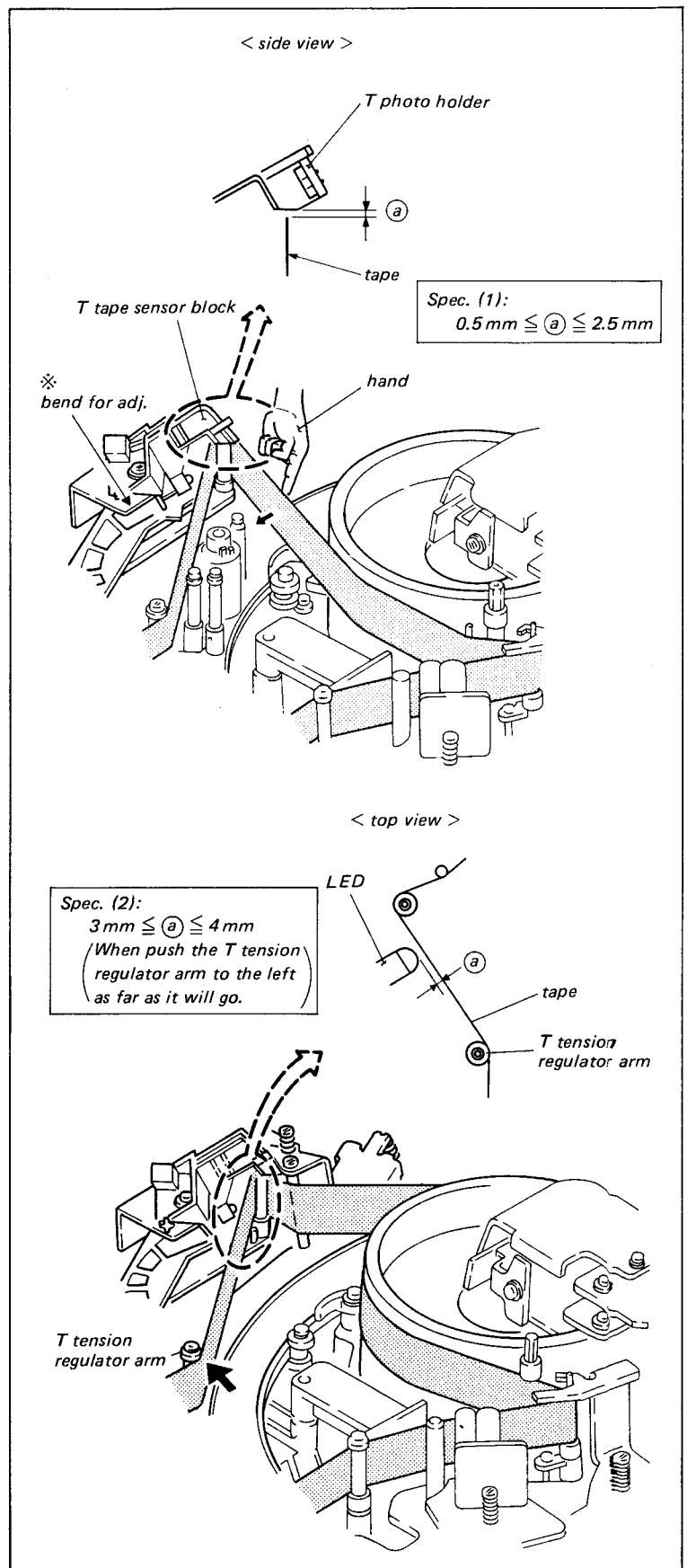
Tool and equipment:
Thickness gauge

Check procedure:

- Thread a tape and put the machine into FR-STOP mode. Push the tape against the cassette tape side with finger as shown in figure. Check that the clearance between the upper edge of a tape and the under side of T photo holder block (black colored plastic) meets the required specification (Spec. (1)).
- Put the machine into PAUSE mode. Push the T tension regulator arm to the left as far as it will go. On the T tape sensor block, check that the clearance between the video tape and the tip of LED meets the required specification (Spec. (2)).

Adjustment procedure:

- Bend the ※ marked position in figure with pliers so that meets the required specification. Confirm as check procedure (2).
- Adjust the position of the T tape sensor block by the flat blade screwdriver, 3 mm dia. so that meets the required specification (2).



5-6. TENSION ARM SYSTEM ADJUSTMENT

5-6-1. S Drawer Roller Ass'y Limiter Adjustment

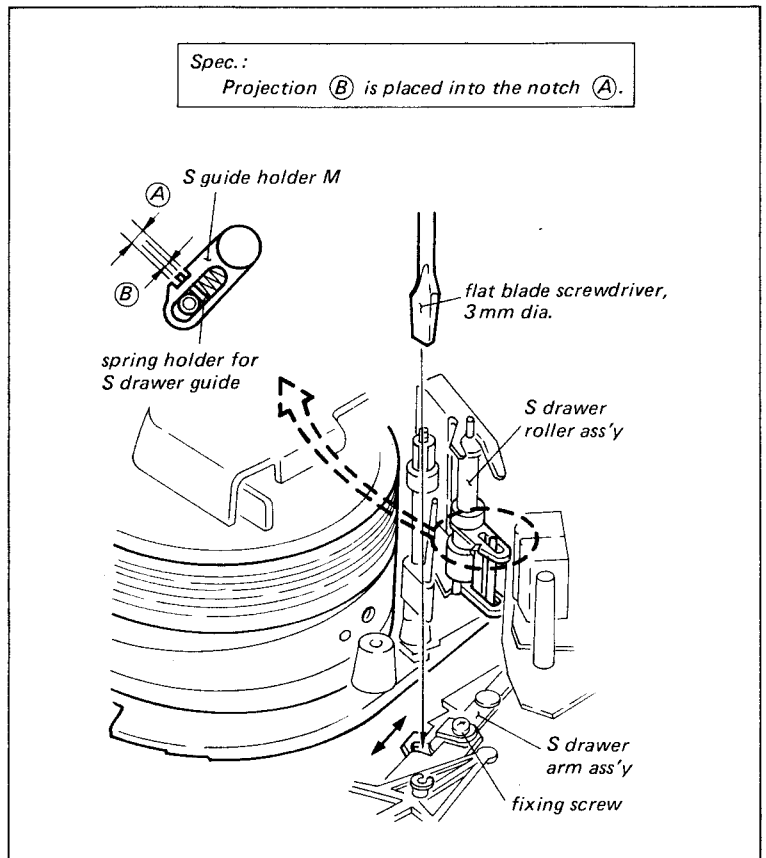
Mode: FR-STOP

Check procedure:

Check that the spring holder for S drawer guide, marked (B), of the S drawer arm ass'y is placed into notch of the S guide holder M, marked (A).

Adjustment procedure:

- (1) Adjust the position of the S drawer arm ass'y by the flat blade screwdriver, 3 mm dia. so that meets the required specification.



5-6-2. T Tension Regulator Operating Position Adjustment

Mode: FR-STOP

Tool and equipment:

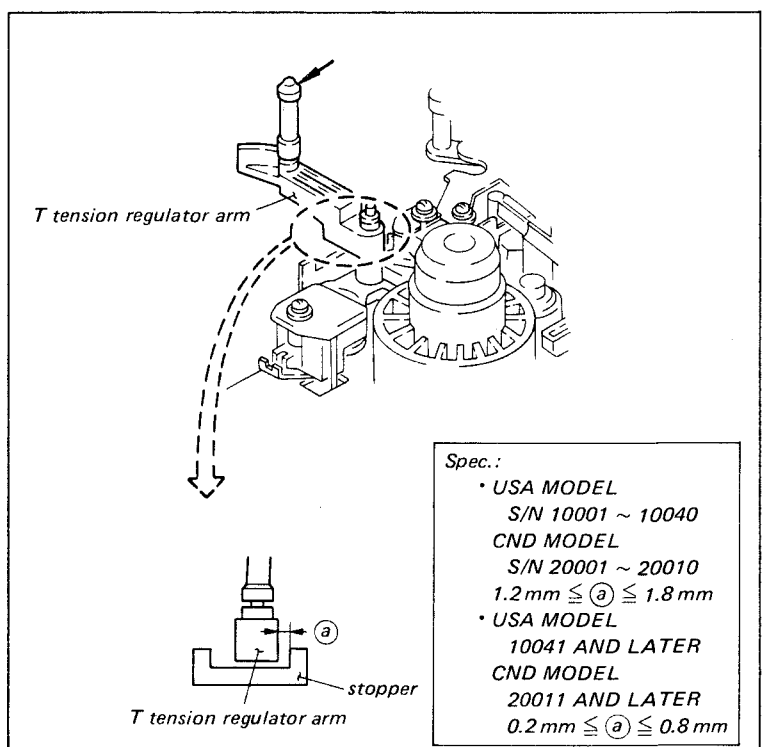
Thickness gauge

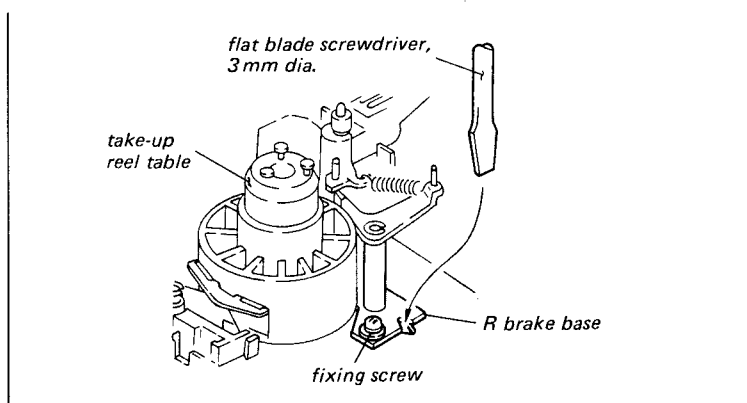
Check procedure:

- (1) Push the T tension regulator arm lightly to the left with finger as far as it will go (in the arrow direction), and remove the finger gently.
- (2) Check that the clearance between T tension regulator arm and stopper meets the required specification.

Adjustment procedure:

- (1) Adjust the position of R brake lever by the flat blade screwdriver, 3 mm dia. so that meets the required specification.





5-6-3. S Tension Regulator Operating Position Adjustment

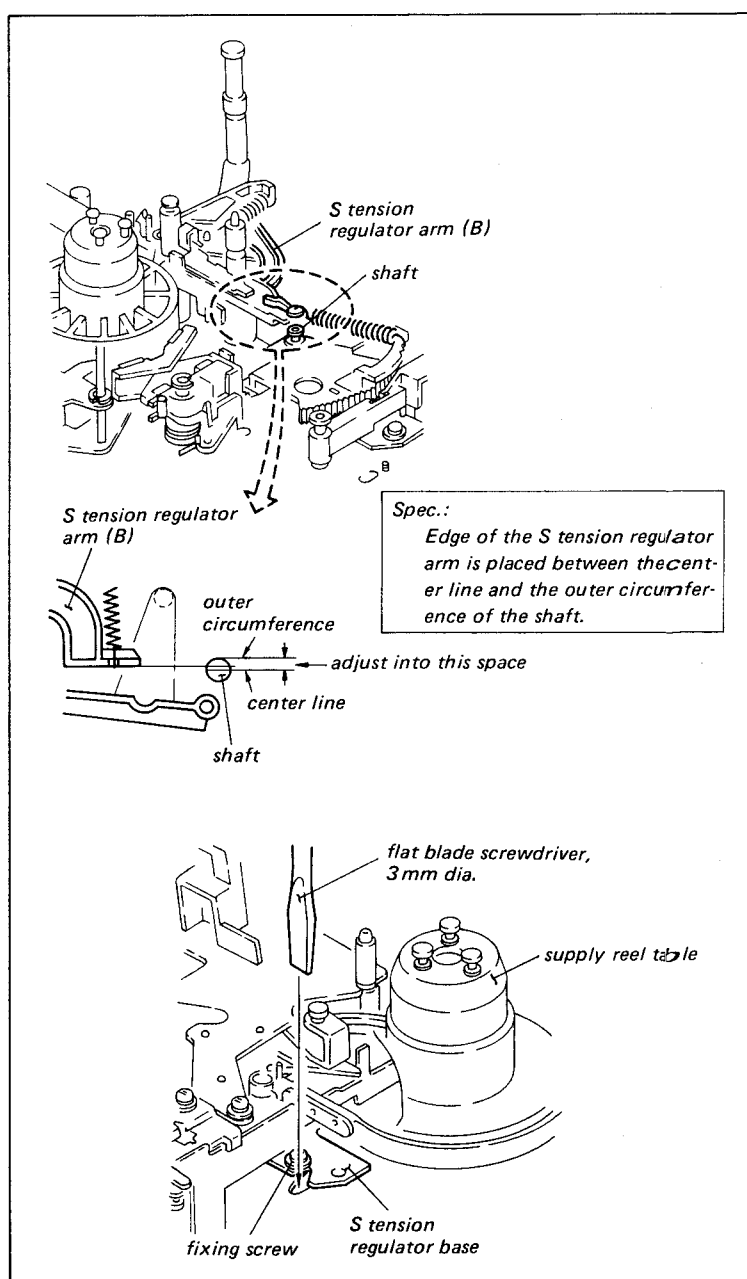
Mode: FF

Check procedure:

- (1) Put the machine into FF mode without cassette tape.
- (2) Check that the edge of S tension regulator arm (B) meets the required specification.

Adjustment procedure:

- (1) Adjust the position of S tension regulator base so that meets the required specification.



5-6-4. Tension Detector Position Adjustment

Mode: FWD/REV

Tool and equipment:
DC voltmeter

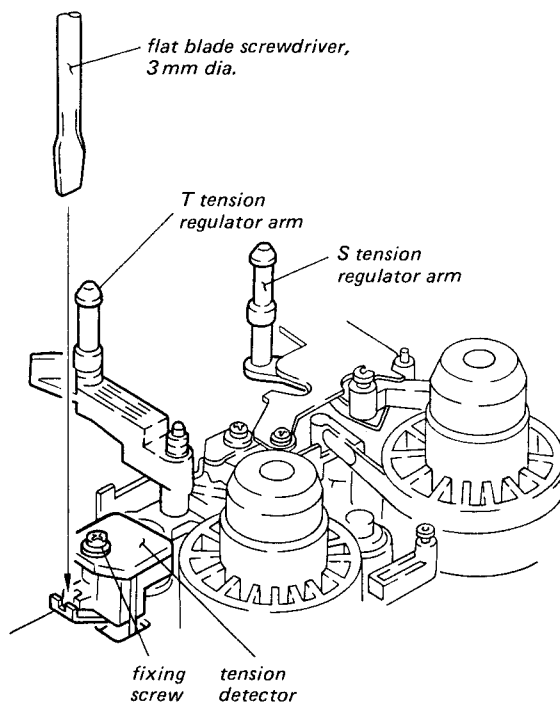
Preparation: Connect dc voltmeter to TP17/SY-68 board.

Check procedure:

- (1) Put the machine into FWD mode without cassette tape.
- (2) Push the T tension regulator arm to the right with finger as far as it will go. Check that the dc voltage is more than 9 V.
- (3) Push the T tension regulator arm to the left with finger as far as it will go. Check that the dc voltage is less than 2 V.
- (4) Put the machine into REV mode.
- (5) Push the S tension regulator arm to the right with finger as far as it will go. Check that the dc voltage is less than 2 V.
- (6) Push the S tension regulator arm to the left with finger as far as it will go. Check that the dc voltage is more than 9 V.

Adjustment procedure:

- (1) Adjust the position of tension detector so that meets the required specification.



5-7. 10 TIMES PICTURE SEARCH OPERATING POSITION ADJUSTMENT

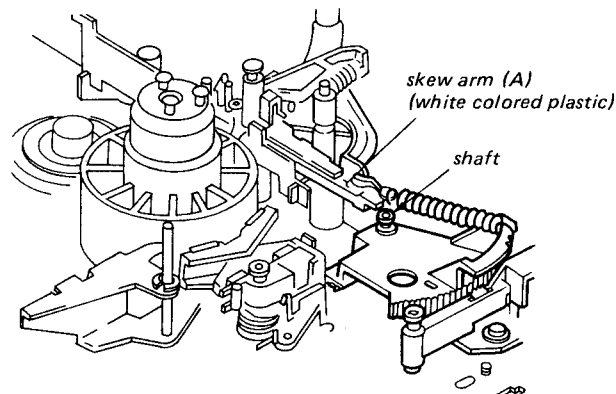
Mode: EJECT completion

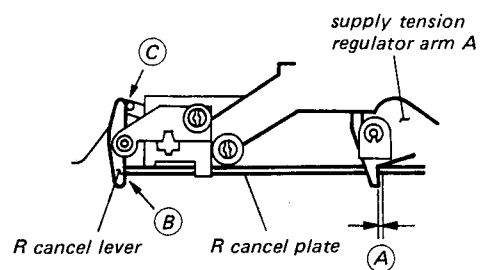
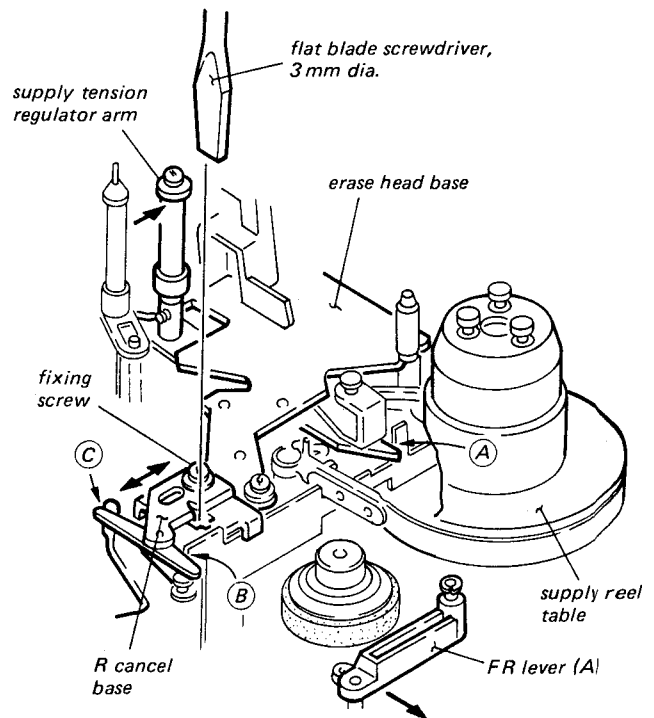
Check procedure:

- (1) Turn the gear box pulley to the counterclockwise so that the right-end round hole of skew arm (A) is placed to the just above the shaft on the chassis as shown in figure (viewing through the round hole of skew arm (A)).
- (2) Move the FR lever (A) in the arrow direction as far as it will go. Check that the clearances (A), (B) and (C) meets the required specification.
- (3) Press the supply tension regulator arm in the arrow direction and take hand off. Confirm as procedure (2).

Adjustment procedure:

- (1) Adjust the position of the R cancel base with the flat blade screwdriver, 3 mm dia. so that meets the required specification.
- (2) Confirm as check procedure (3).





Spec.:
 (A) (B) : There are no clearances.
 $0.1 \text{ mm} \leq (C) \leq 0.5 \text{ mm}$

5-8. SOLENOID SYSTEM ADJUSTMENT

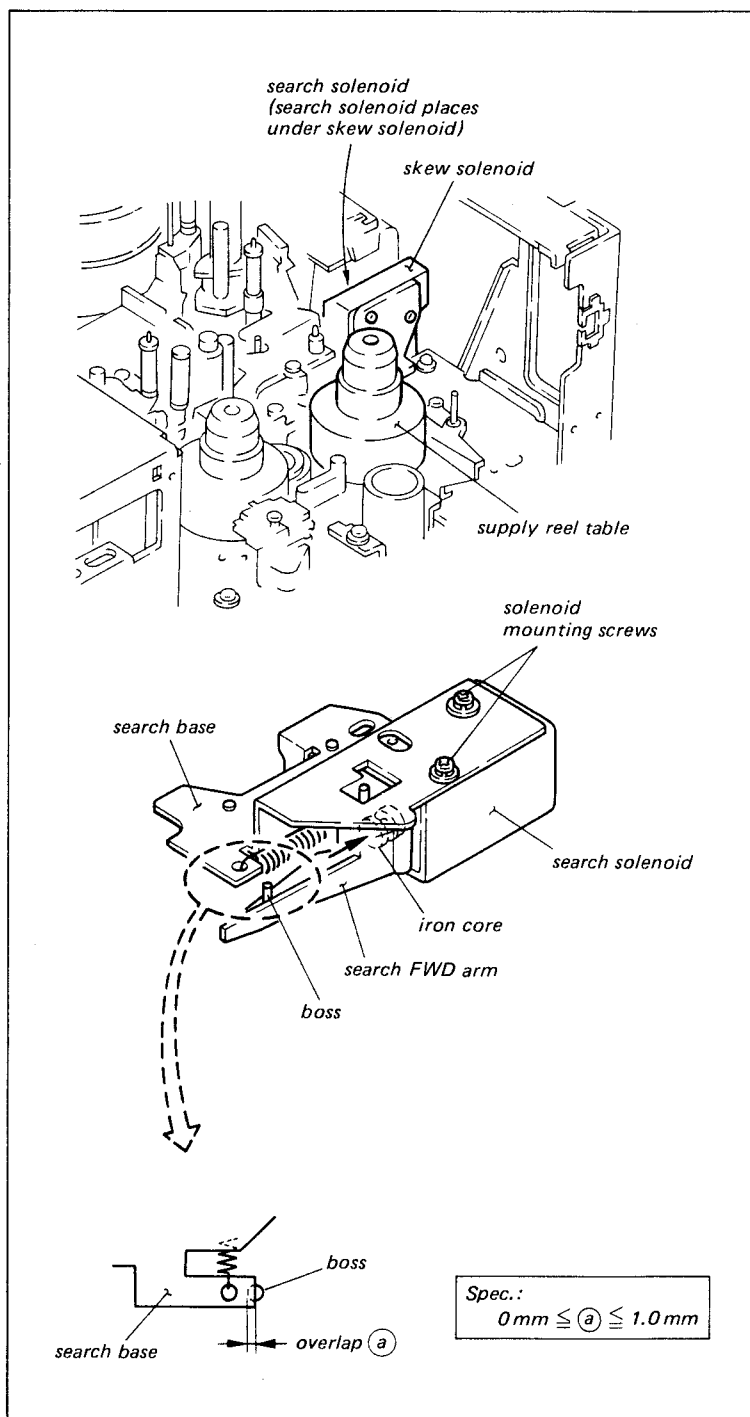
5-8-1. Search Solenoid Mounting Position Adjustment

- This adjustment is usually not required. But proceed with the following step only when the search solenoid is replaced or removed.

Mode: Remove the search solenoid block from the chassis.

Adjustment procedure:

Move the iron core into the fully energized position (indicated by the arrow as far as it will go). Adjust the mounting position of the search solenoid so that the overlap of the search FWD arm boss and the search base meet the required specification.



5-8-2. Skew Solenoid Mounting Position Adjustment

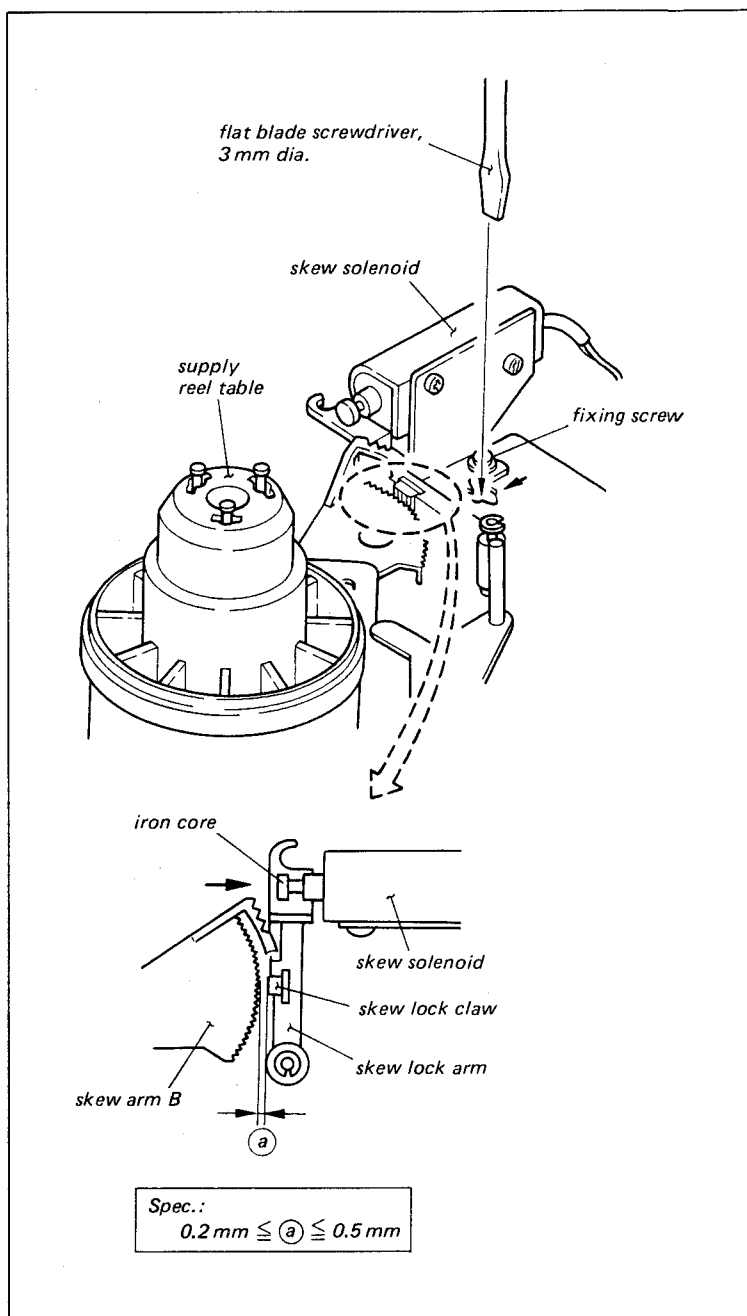
Mode: EJECT completion

Check procedure:

Check that the clearance between the skew lock claw and the skew arm B meets the required specification when the skew solenoid iron core is push in the arrow direction.

Adjustment procedure:

Adjust the position of the skew solenoid with a flat blade screwdriver, 3 mm dia. so that meets the required specification.



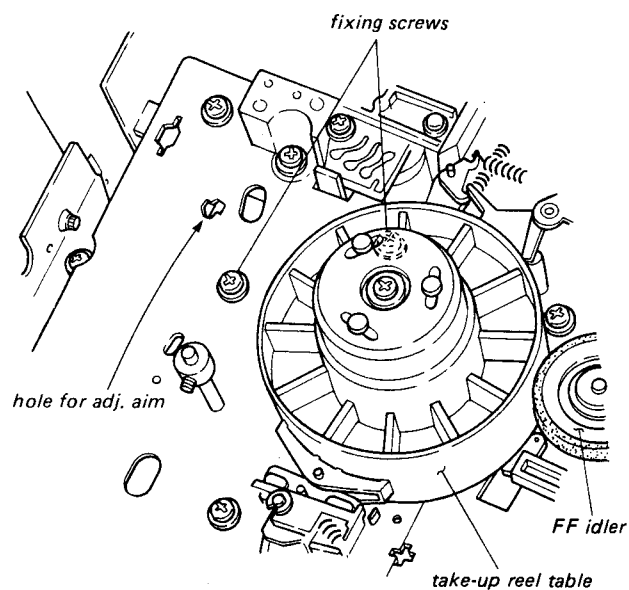
5-8-3. T Idler Solenoid Position Adjustment

- This adjustment is performed when T idler solenoid is replaced or removed and F.FWD torque does not meet the specification.

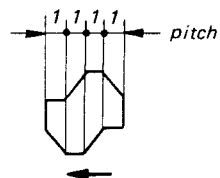
Mode: F.FWD mode without cassette tape

Adjustment procedure:

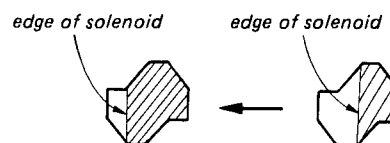
- (1) Put the machine into F.FWD mode without cassette tape.
- (2) Loosen the T idler solenoid fixing screws about 1/2 turn.
- (3) Adjust the position of the T idler solenoid so that 0.01 ~ 0.1 mm clearance exists between the take-up reel table and the FF idler.
- (4) Note the hole to be provided for adjusting aim after proceeding the procedure (3).
Confirm that where the edge of this solenoid is placed in this hole.
- (5) Move the solenoid in the arrow direction only one pitch from the position of procedure (4), and tighten the fixing screws.



< hole for adj. aim >



< for example >



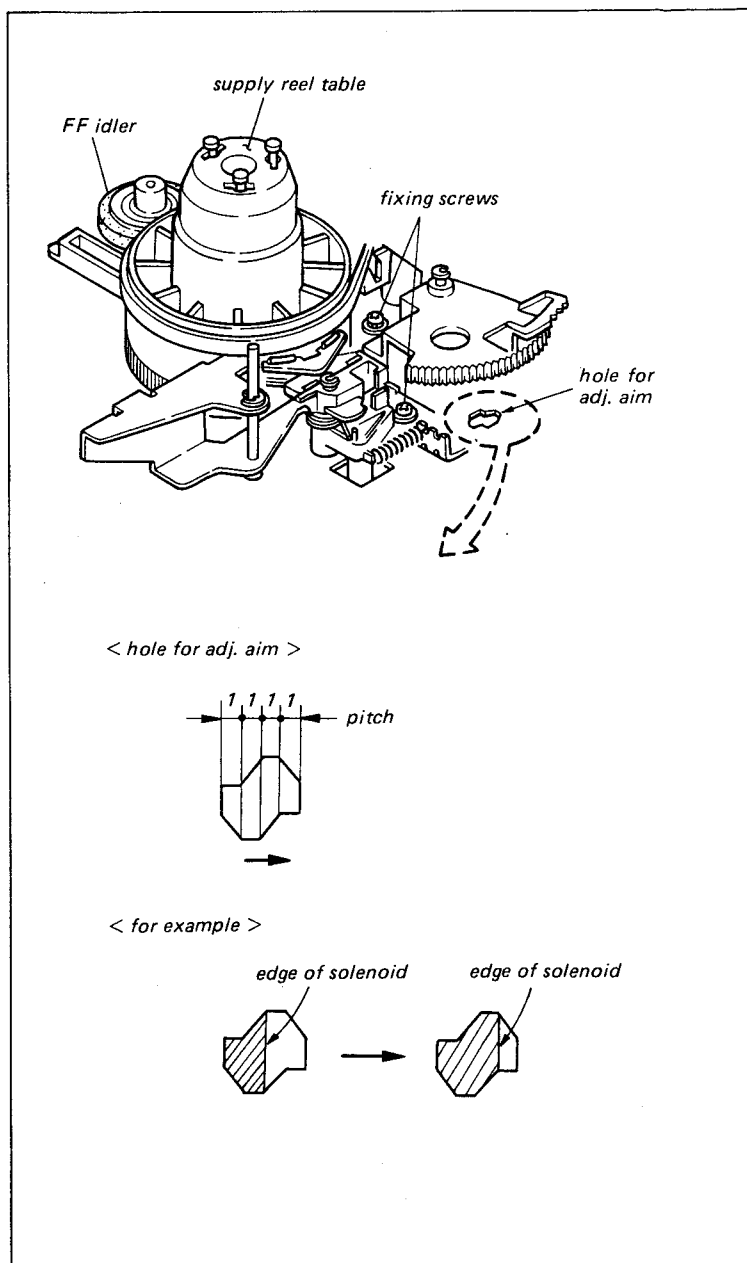
5-8-4. S Idler Solenoid Position Adjustment

- This adjustment is required only when the supply idler solenoid is replaced or removed and the REW torque does not meet the specification.

Mode: REW mode without cassette tape

Adjustment procedure:

- (1) Put the machine into REW mode without cassette tape.
- (2) Loosen the supply idler solenoid fixing screws about 1/2 turn.
- (3) Adjust the position of the S idler solenoid so that 0.01 ~ 0.1 mm clearance exists between the supply reel table and the FF idler.
- (4) Note the hole to be provided for adjusting aim after proceeding the procedure (3).
Confirm that where the edge of this solenoid is placed in this hole.
- (5) Move the solenoid in the arrow direction only one pitch from the position of procedure (4). Tighten fixing screws.



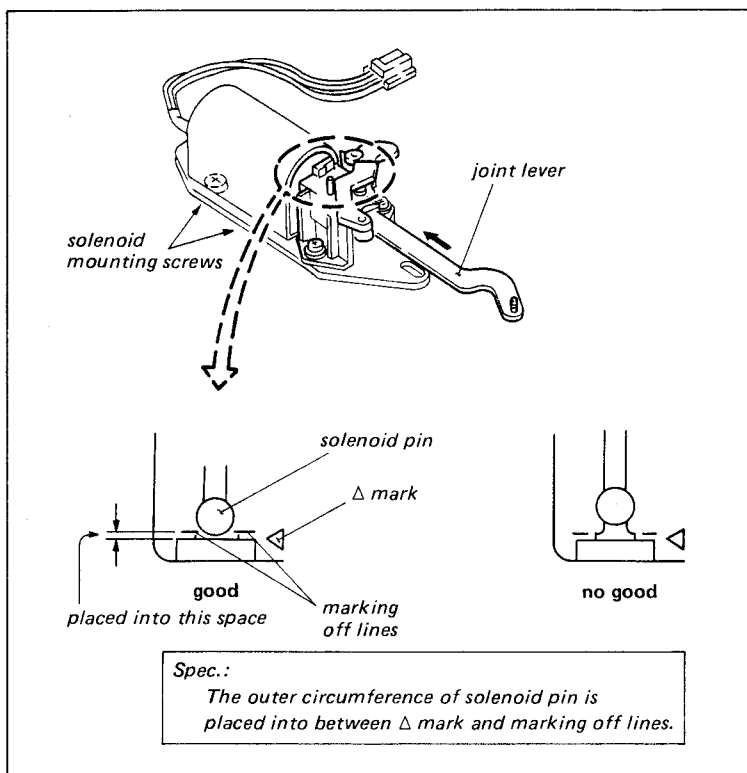
5-8-5. Pinch Solenoid Mounting Position Adjustment

- This adjustment is usually not required. Proceed with the following step only when the pinch solenoid is replaced or removed.

Mode: Remove the pinch solenoid block from the chassis.

Adjustment procedure:

Move the joint lever into the fully energized position (indicated by the arrow as far as it will go). Adjust the solenoid mounting position so that the outer circumference of solenoid pin meets the required specification.



5-8-6. 10 Times Picture Search Solenoid Mounting Position Adjustment

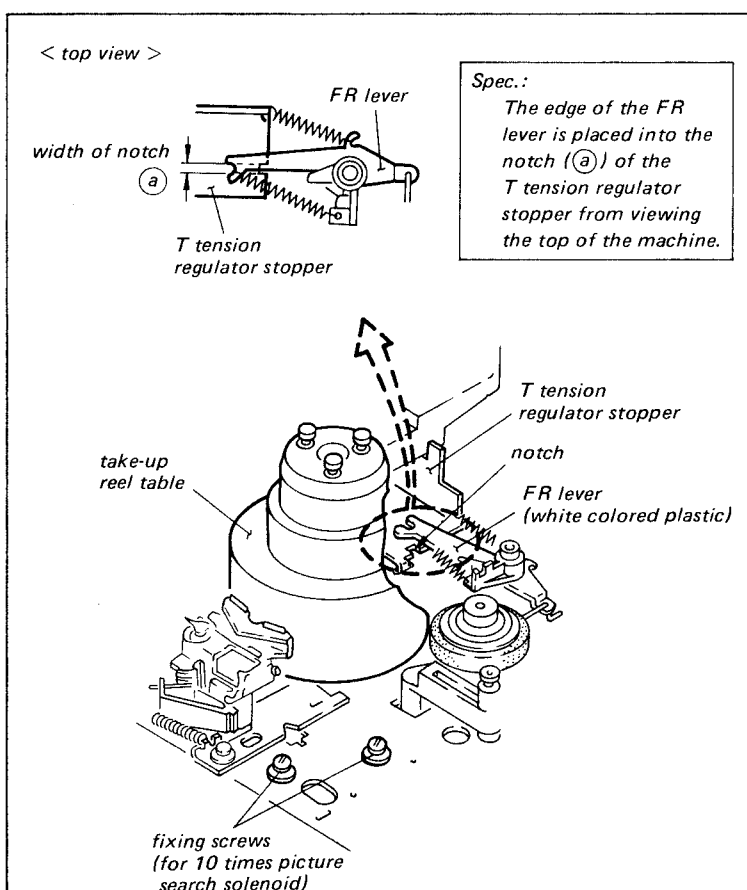
Mode: EJECT completion

Check procedure:

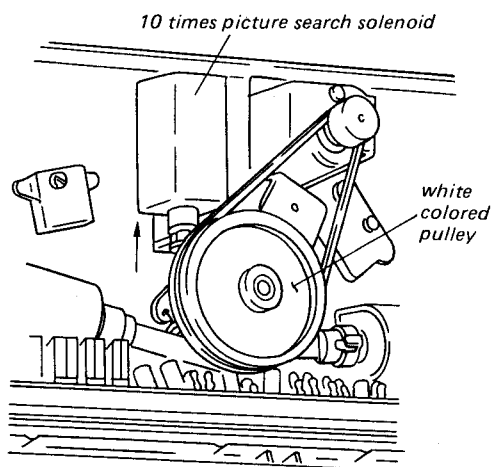
- (1) Put on the machine right side down.
- (2) Press the iron core of 10 times picture search solenoid, near the white pulley, into the fully energized position (indicated by the arrow with finger).
- (3) Check that the relationship between the edge of FR lever and the T tension regulator stopper notch under the FR lever meets the required specification.

Adjustment procedure:

- (1) Adjust the position of the 10 times picture search solenoid so that meets the required specification.



< rear view >



5-8.7. T Brake Solenoid Position Adjustment

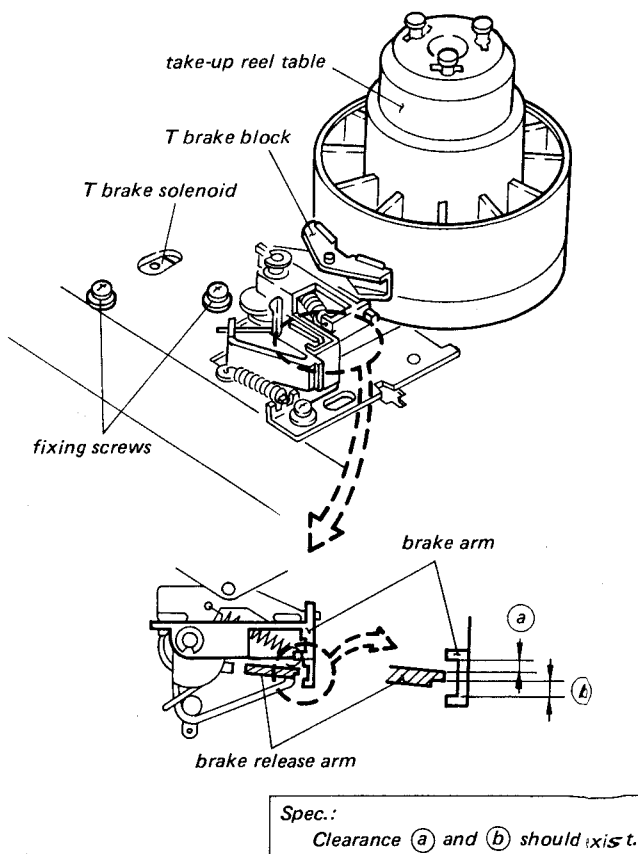
Mode: REW mode without cassette tape

Check procedure:

Check that the relationship between the brake release arm and the brake arm meets the required specification.

Adjustment procedure:

Adjust the position of the T brake solenoid so that meets the required specification.



5-8-8. S Brake Solenoid Position Adjustment

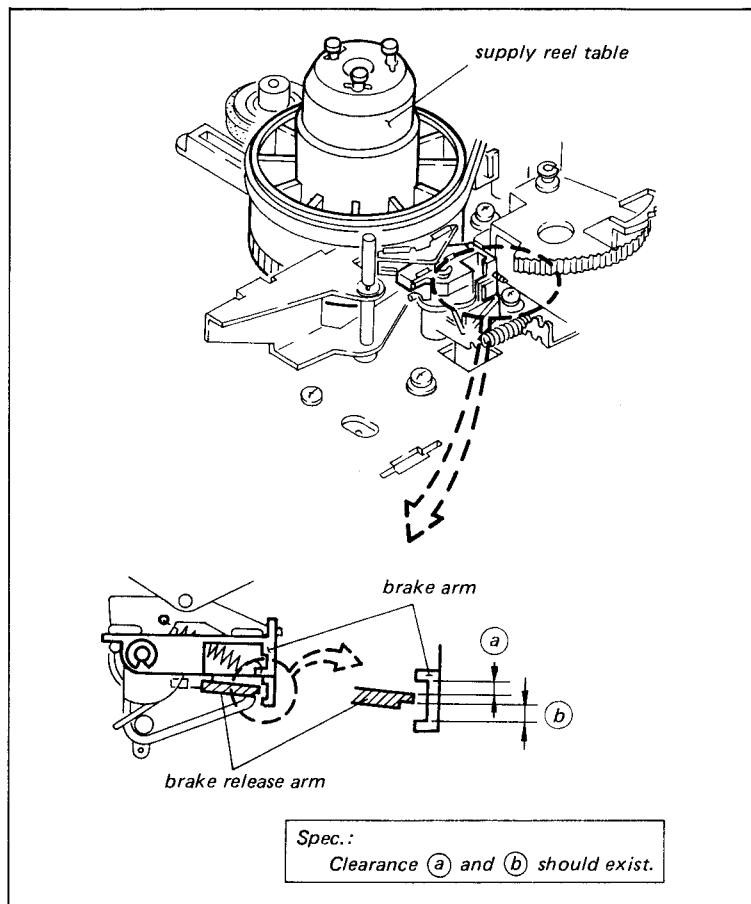
Mode: REW mode without cassette tape

Check procedure:

Check that the relationship between the brake release arm and the brake arm meets the required specification.

Adjustment procedure:

Adjust the position of the S brake solenoid so that meets the required specification.



5-9. CASSETTE-UP COMPARTMENT ADJUSTMENT

- The cassette-up compartment has two photo-electrical switches. The on/off timing of these switches are adjusted as follows.

5-9-1. Cassette-in Switch Position Adjustment

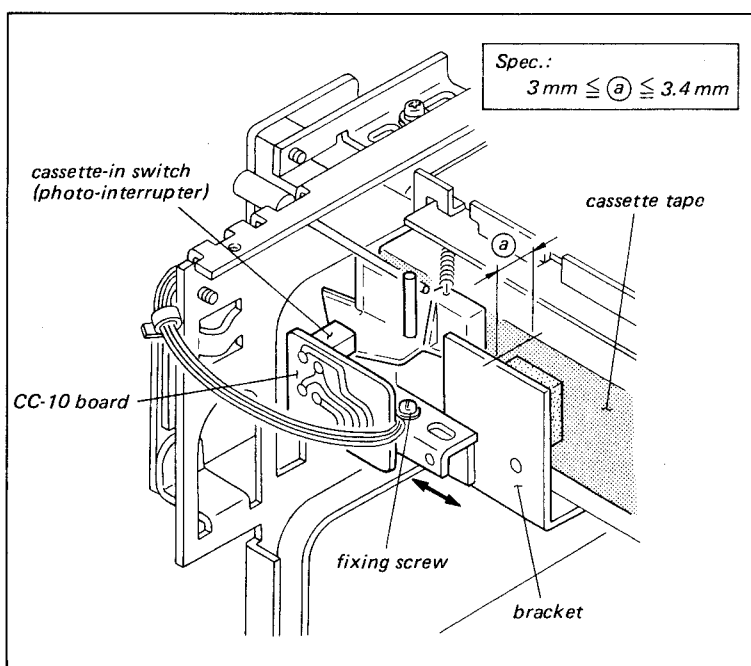
Tool and equipment:

KCA type cassette tape.
Tester.
Thickness gauge.

- Preparation:**
- (1) Remove the cassette-up compartment from the chassis.
 - (2) Connect the plug of the harness for cassette-up compartment and the terminal on the CC-9 board with the jumper leads.

plug of harness (CN1)	terminal on CC-9 board
4pin (5 V) ←	4pin/CN1
5 or 2pin (GND) ←	5 or 2pin/CN1

- (3) Turn POWER on.



Check procedure:

- (1) Connect the tester to ② terminal on CC-9 board.
- (2) Insert a KCA type cassette tape slowly.
- (3) Check that the clearance between the front side of the cassette tape and the bracket of cassette-up compartment meets the required specification when the tester is turned "H" level (about 5 V).

Adjustment procedure:

- (1) Adjust the position of the cassette-in switch in the arrow direction so that meets the required specification.

Adjusting procedure;

Insert a 3.3 mm thick thickness gauge between cassette tape and bracket. Adjust the position of the cassette-in switch so that the tester is turned to "H" in this position.

5-9-2. Cassette-down Switch Position Adjustment**Tool and equipment:**

Tester

Preparation

- (1) Remove the cassette-up compartment from the chassis.
- (2) Connect the plug of the harness for cassette-up compartment and the terminal on CC-9 board with the jumper leads.

plug of harness (CN1)	terminal on CC-9 board
4pin (5 V) ←	4pin/CN1
5 or 2pin (GND) ←	5 or 2pin/CN1

- (3) Turn POWER on.

Check procedure:

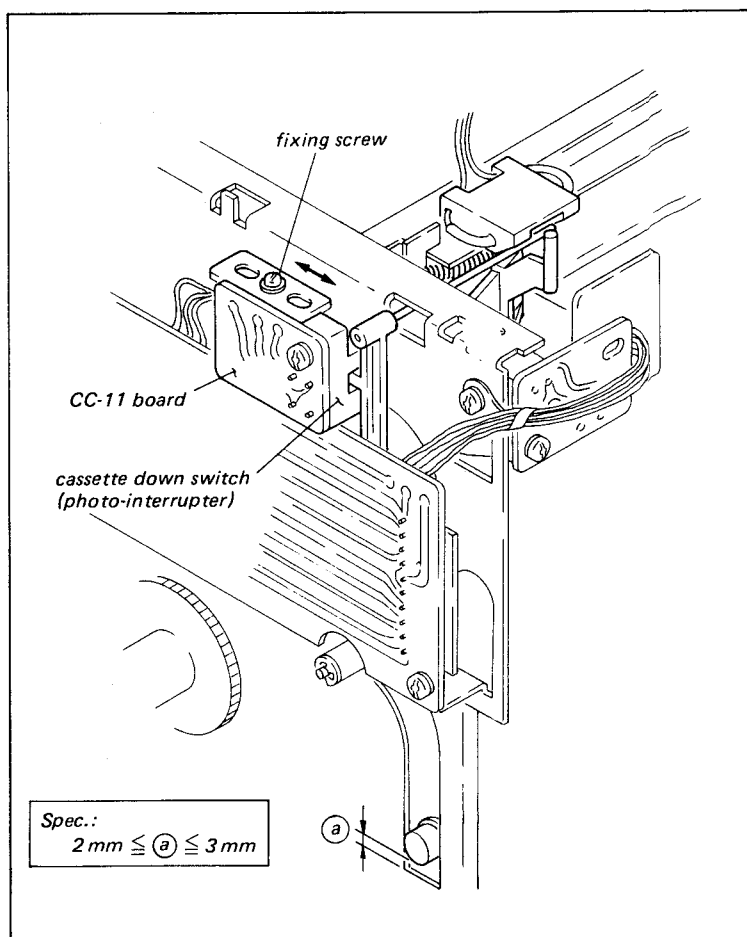
- (1) Connect the tester to ⑤ terminal on CC-9 board.
- (2) Turn the white colored gear on the right side of the cassette-up compartment in the clockwise direction.
- (3) Check that the clearance between the roller and the guide meets the required specification.

Adjustment procedure:

- (1) Adjust the position of the cassette-down switch in the arrow direction so that meets the required specification.

Adjusting procedure;

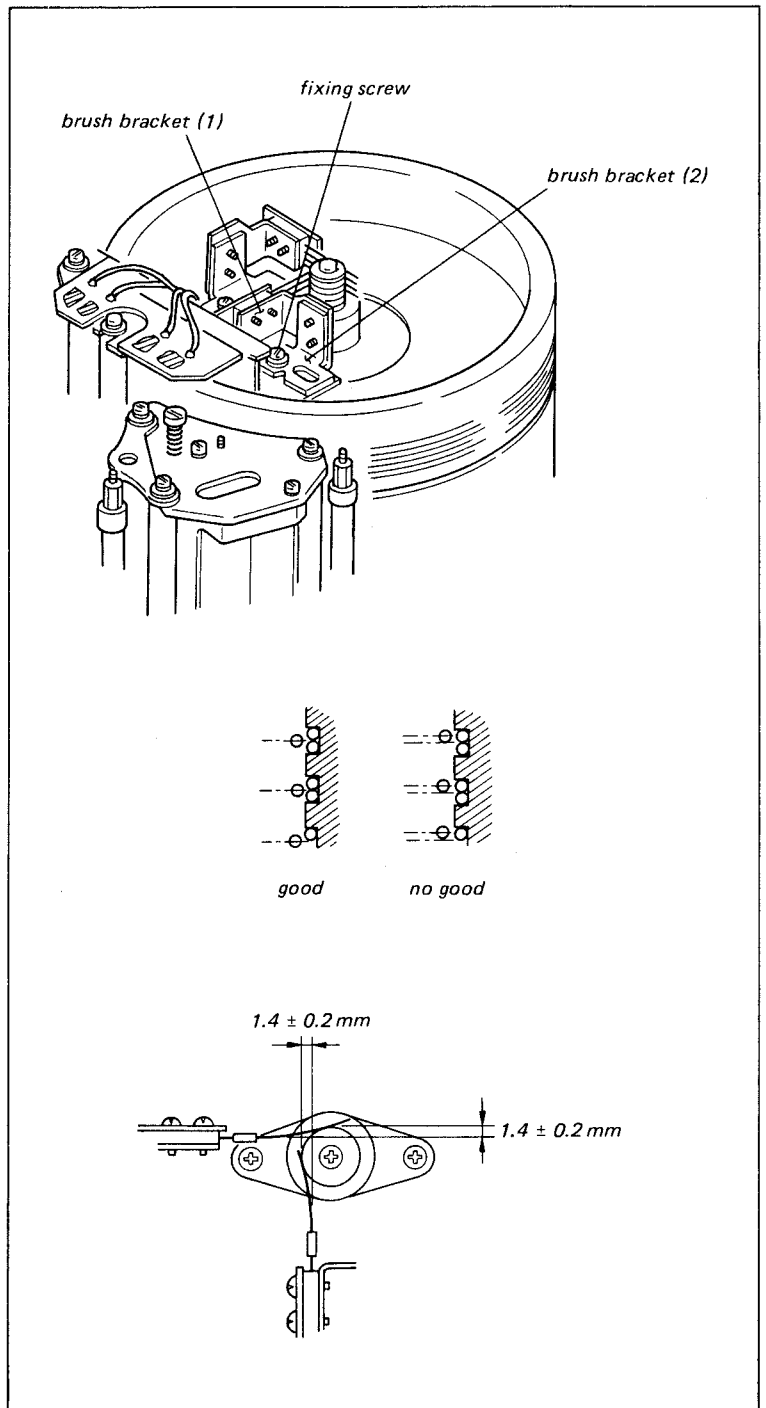
Turn the gear on the right side so that the clearance between the roller and the guide is 2.2 mm clearance. Adjust the position of the cassette-down switch so that the tester is turned to "H" in this position.



5-10. BRUSH POSITION ADJUSTMENT

Adjustment procedure:

- (1) Loosen the fixing screw of the brush bracket (2) and disengage the brush from the slip-ring. And tighten the fixing screw.
- (2) Loosen the fixing screw of the brush bracket (1). Adjust the height of the brush bracket (1) to meet the specification.
- (3) Loosen the fixing screw of the brush bracket (2) again. Adjust the position of the brush to meet the specification.



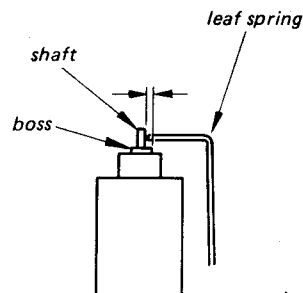
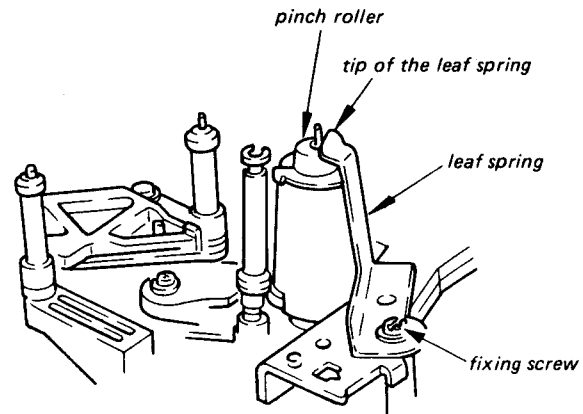
5-11. LEAF SPRING POSITION ADJUSTMENT

Check procedure:

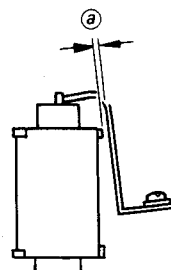
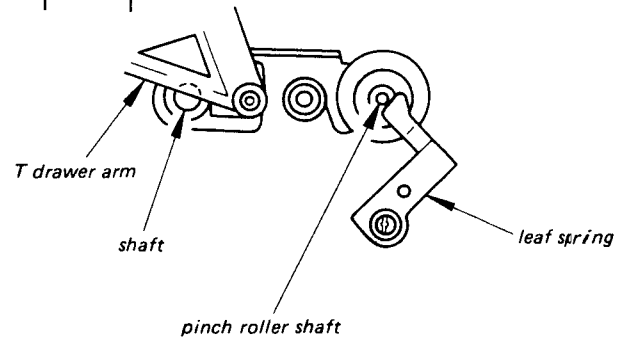
- (1) Turn on POWER. Put the machine into the EJECT mode after put into the PLAY mode once.
- (2) Turn the gear box pulley with finger so that the edge of the T drawer arm is placed into the center of the shaft as shown in figure.
- (3) Check that the relationship between leaf spring and pinch roller shaft meets the required specification 1.
- (4) Put the machine into the EJECT completion mode. Check that the clearance between leaf spring and pinch roller.

Adjustment procedure:

- (1) Adjust the position of the leaf spring so that meets the required specifications.



Spec. 1:
Tip of the leaf spring is placed between the shaft and the outer surface of the boss.



Spec. 2:
Clearance (a) should exist.

5-12. PINCH LEVER RIGHT ANGLE ADJUSTMENT

This adjustment is precisely factory-calibrated before shipment so that no adjustment is required except the pinch lever and the capstan shaft replacement.

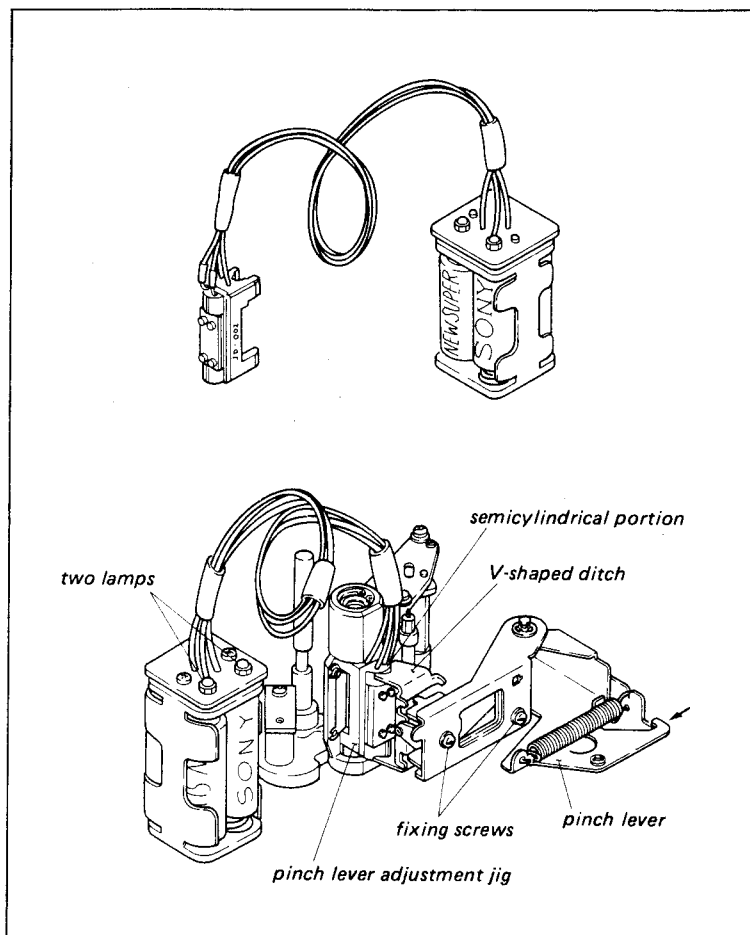
Tool : Pinch lever adjustment jig

Mode : EJECT completion

Check procedure: (1) Install the pinch lever adjustment jig taking care not to give scar on the capstan.
(2) Push the pinch lever until V-shaped ditch of the pinch lever contacts the semicylindrical portion of the jig lightly. Check that the two lamps of the jig light at the same time.

Adjustment procedure:

- (1) Loosen the two fixing screws of the pinch lever and adjust the V-shaped ditch to the correct position.
- (2) After this adjustment, tighten the fixing screws and check again.



SECTION 6

BACK TENSION AND TORQUE ALIGNMENT

6-1. BRAKE SYSTEM ADJUSTMENT

6-1-1. S Brake Torque Adjustment

Tool and equipment:

Reel table torque measurement tape
(100 mm dia.)
Tension scale (200 g full scale).

Mode: EJECT completion/POWER off.

Check procedure:

- (1) Grasp the top of the supply reel table with finger. Check that the clearance between the brake arm and the lining holder meets the required specification (1) as shown in figure as it is turned clockwise direction approx. 30 degrees.
- (2) Install the jig tape on the supply reel table and hook a tension scale on an end of the jig tape. Pull out the tape at the constant speed of approx. 9.5 cm/sec. in the arrow direction. Check that the scale reading meets the required specification (2).

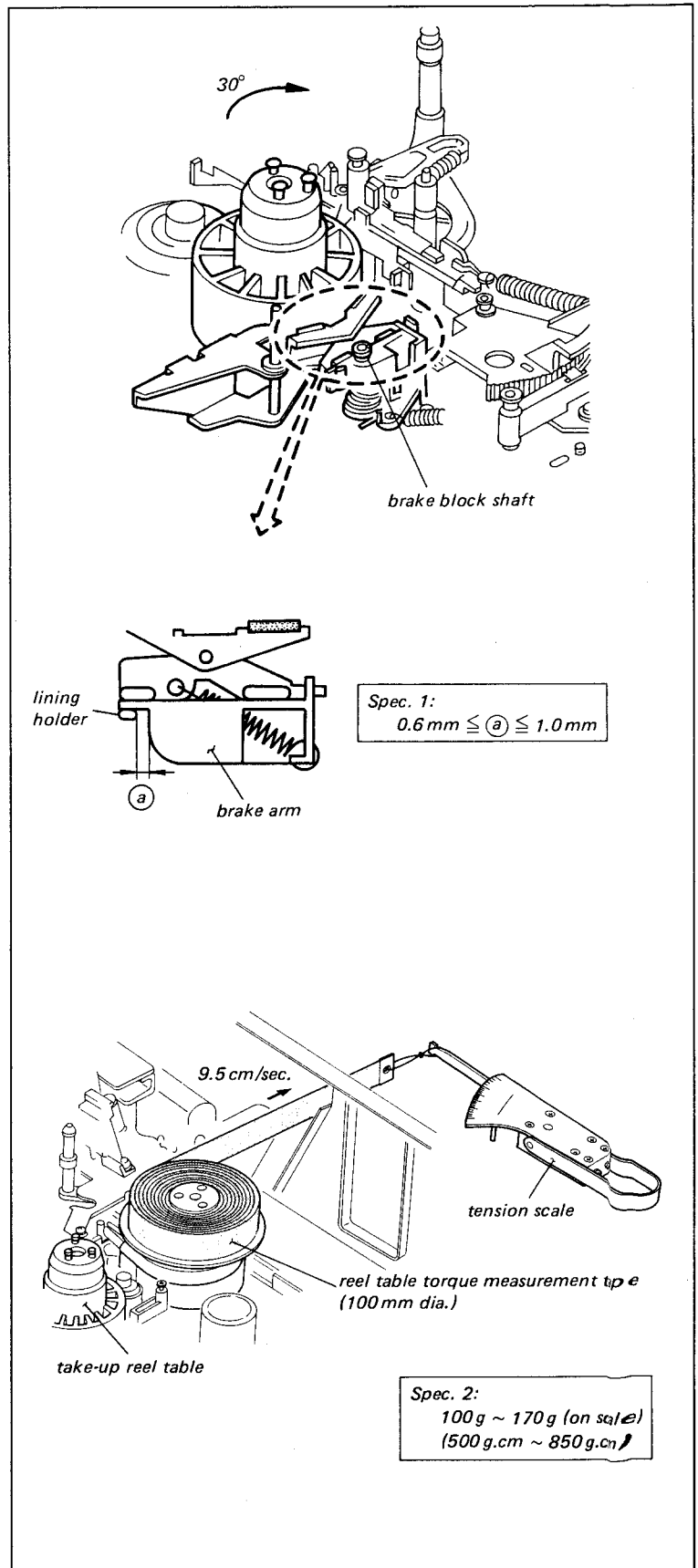
Adjustment procedure:

For spec. 1

- (1) Bend the brake block shaft toward the reel table or the opposite direction with finger.

For spec. 2

- (2) Clean the surface of the reel table with cloth moistened with cleaning fluid.
- (3) If the scale reading does not meet the specification (2), replace the lining holder and check again.
- (4) If not in step (2), replace the reel table and check again.



6-1-2. T Brake Torque Adjustment

Tool and equipment:

Reel table torque measurement tape
(100 mm dia.)
Tension scale (200 g full scale).

Mode: EJECT completion/POWER off.

Check procedure:

- (1) Grasp the top of the take-up reel table with finger. Check that the clearance between the brake arm and the lining holder meets the required specification (1) as shown in figure as it is turned clockwise direction approx. 30 degrees.
- (2) Install the jig tape on the take-up reel table and hook a tension scale on an end of the jig tape. While pushing the T tension regulator arm to the left as far as it will go, pull out the tape at the constant speed of approx. 9.5 cm/sec. in the arrow direction. Check that the scale reading meets the required specification (2).

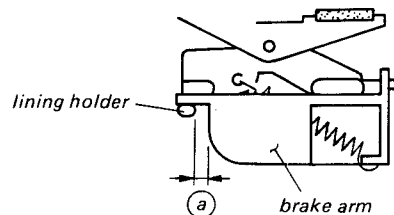
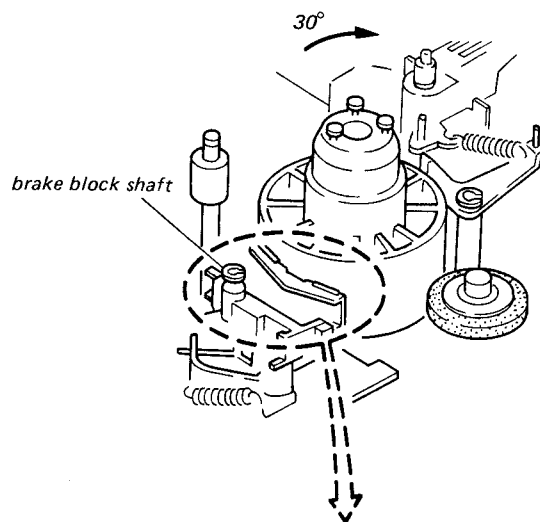
Adjustment procedure:

For spec. 1

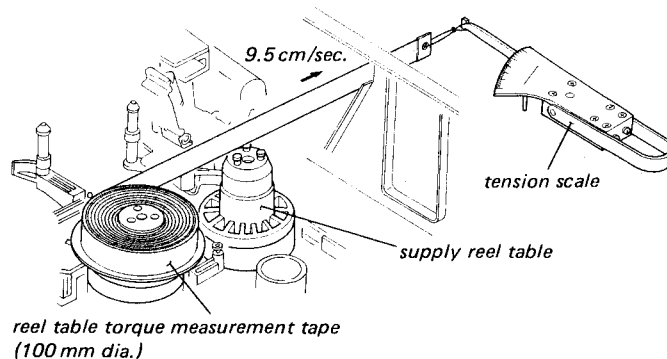
- (1) Bend the brake block shaft toward the reel table or the opposite direction with finger.

For spec. 2

- (2) Clean the surface of the reel table with cloth moistened with cleaning fluid.
- (3) If the scale reading does not meet the specification (2), replace the lining holder and check again.
- (4) If not in step (2), replace the reel table and check again.



Spec. 1:
 $0.6 \text{ mm} \leq a \leq 1.0 \text{ mm}$



Spec. 2:
100 g ~ 170 g (on scale)
(500 g.cm ~ 850 g.cm)

6-1-3. REW Brake Torque Adjustment

Tool and equipment:

Reel table torque measurement tape
(100 mm dia.)
Tension scale (50 g full scale)

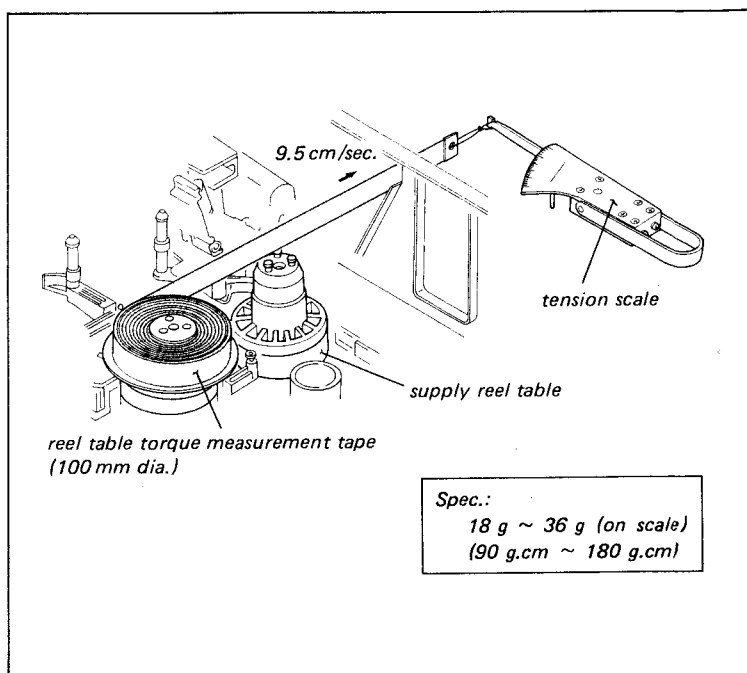
Mode: REW

Check procedure:

- (1) Install the jig tape on the take-up reel table and hook a tension scale on an end of the jig tape.
- (2) Put the machine into the REW mode. Pull out the tape at the constant speed of approx. 9.5 cm/sec. in the arrow direction. Check that the scale reading meets the required specification.

Adjustment procedure:

- (1) If the scale reading does not meet the specification, replace the R brake ass'y and check again.
- (2) If not in step (1), replace the reel table and check again.



6-2. FF/REW TORQUE ADJUSTMENT

- It is required that the sec. 5-8-3 T idler solenoid position adj. and sec. 5-8-4 S idler solenoid position adj. are checked to be correct or properly adjusted before initiating this adjustment.

Tool and equipment:

Reel table torque measurement tape
(100 mm dia.)
Tension scale (500 g full scale).

Mode: FF and REW

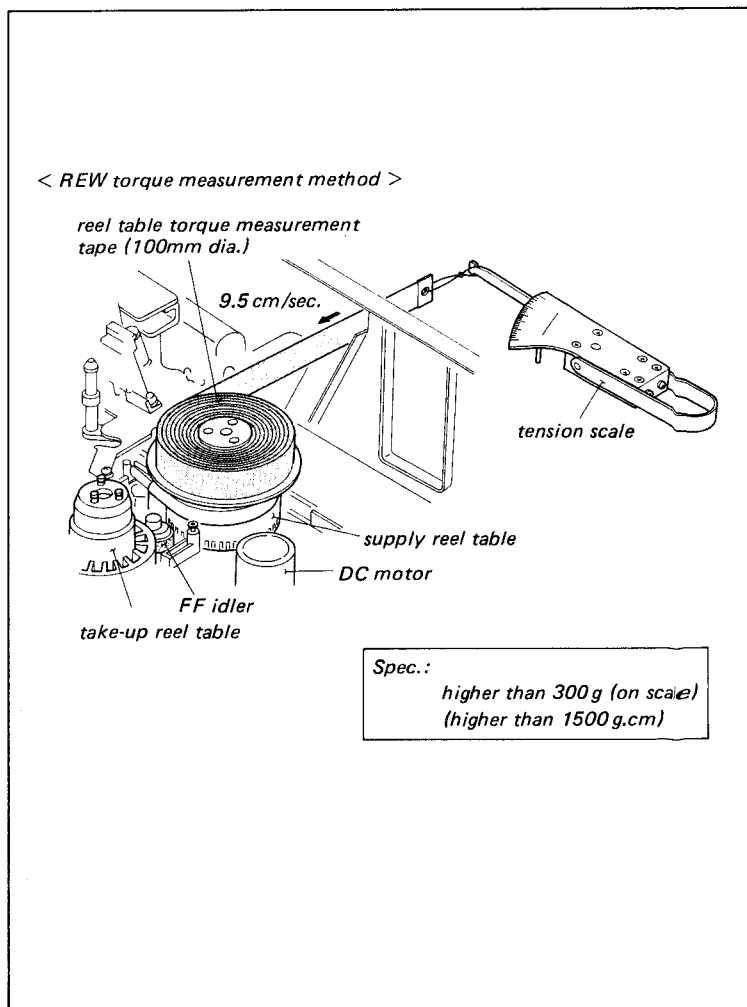
Check procedure:

FF torque

- (1) Install the jig tape on the take-up reel table and hook a tension scale on an end of the tape. Pull out the tape.
- (2) Put the machine into FF mode. Let the tape pulled at the constant speed of approx. 9.5 cm/sec. check that the scale reading meets the required specification.

REW torque

- (3) Install the jig tape on the supply reel table and hook a tension scale on an end of the tape. Pull out the tape.
- (4) Put the machine into the REW mode. Let the tape pulled at the constant speed of approx. 9.5 cm/sec. Check that the scale reading meets the required specification.



Adjustment procedure:

Both FF torque and REW torque are adjusted by the following adjustment procedures.

- (1) Clean the surface of the reel table, FF idler and belt with cloth moistened with cleaning fluid. Check the torque again.
- (2) If not in step (1), put the machine into FF or REW mode without cassette and check that the dc voltage at the terminals of dc motor is $10.5\text{ V} \pm 1.5\text{ V}$ in the FF or REW mode. If the dc voltage is out of spec., check that the circuit operation of MR board operates correctly.
- (3) If not in steps (1) and (2), replace the reel table, FF idler and belt.

6-3. FWD TORQUE ADJUSTMENT

Mode: FWD/FWD search

Check procedure:

- (1) Install the KCS-20 cassette tape at the tape end portion.
- (2) Put the machine into the FWD mode. Check that the relationship between the T tension regulator arm and cassette tape meets the required specification.
- (3) Install the KCA-60 cassette tape at the tape end portion.
- (4) Put the machine into $\times 5$ FWD search mode.
- (5) Check that the tape runs without slack around the T tension regulator arm.
- (6) Push the T tension regulator arm to the left as far as it will go, check that the tape slack is occurred around the T tension regulator arm.

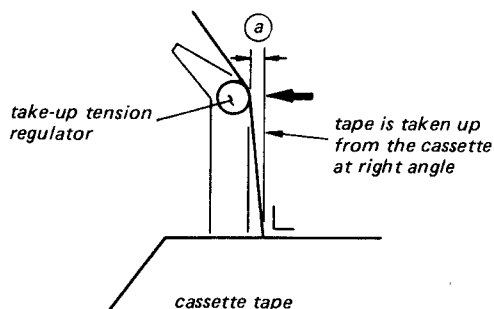
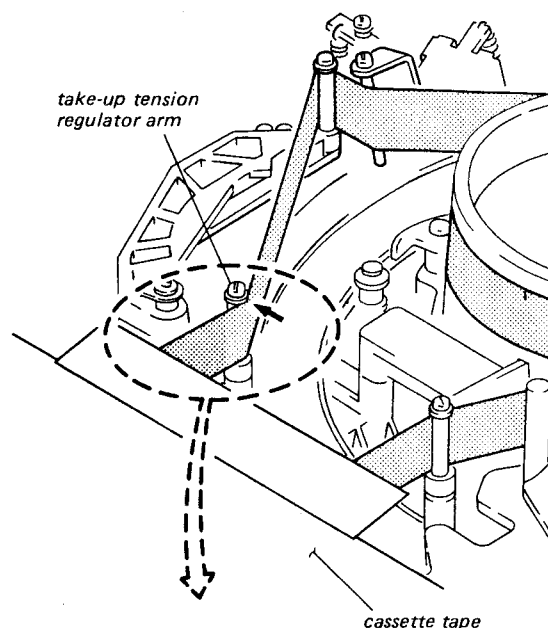
Adjustment procedure:

- (1) Adjust RV-1 on MR-6, RS-6 or MR-11 board meets the required specification in FWD mode.

< NOTE >

- | | |
|---|--------------------|
| <ul style="list-style-type: none"> • USA model | <p>RS-6 board</p> |
| <ul style="list-style-type: none"> Serial number, up to 10140 CND model Serial number, up to 20010 | |
| <ul style="list-style-type: none"> • USA model | <p>MR-6 board</p> |
| <ul style="list-style-type: none"> Serial number, 10141 to 19910 CND model Serial number, 20011 to 20710 | |
| <ul style="list-style-type: none"> • USA model | <p>MR-11 board</p> |
| <ul style="list-style-type: none"> Serial number, 19911 and later CND model Serial number, 20711 and later | |

- (2) Confirm as check procedures (3) ~ (6).



Spec.: $0\text{ mm} \leq a \leq 2\text{ mm}$

6-4. REV TORQUE ADJUSTMENT

Mode: REV (about x1) mode

Check procedure:

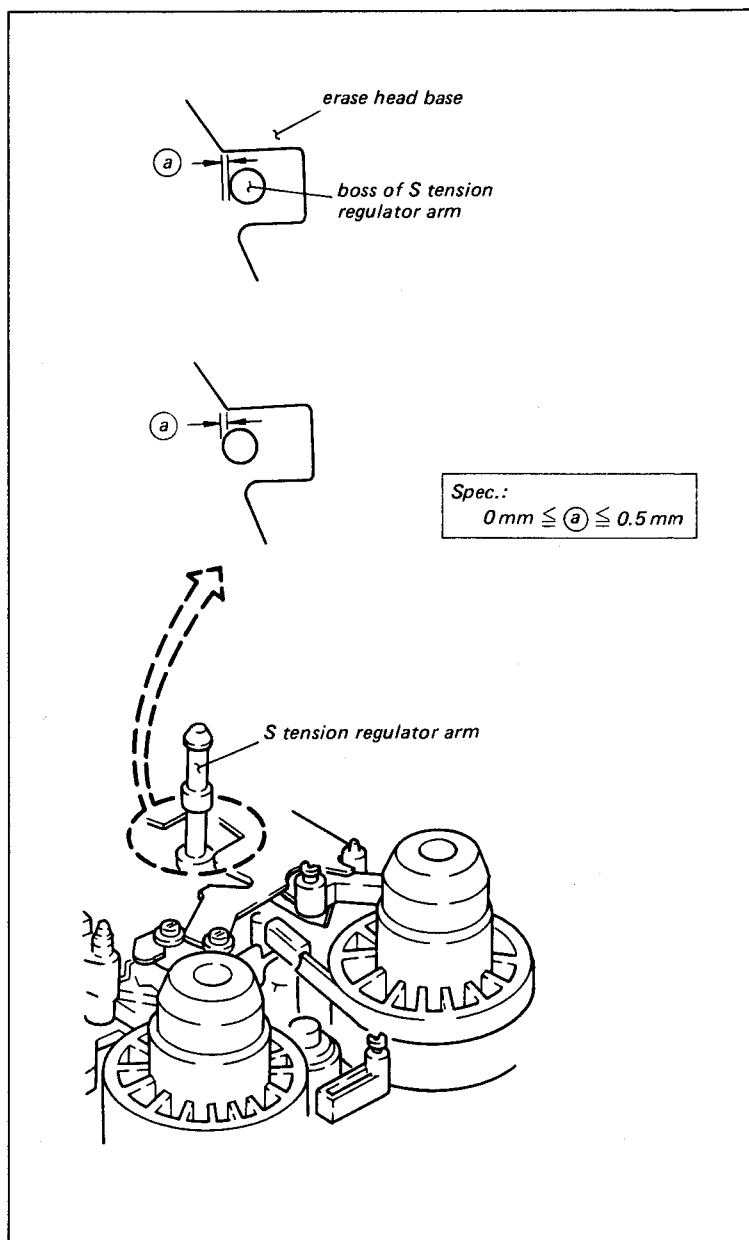
- (1) Install the KCS-20 cassette tape at the tape top portion.
- (2) Put the machine into REV mode.
- (3) Check that the relationship between the boss of S tension regulator and the bracket of erase head base meets the required specification.

Adjustment procedure:

- (1) Adjust RV-2 on MR-6, RS-6 or MR-11 board meets the required specification.

< NOTE >

- | | | |
|--|---|----------------|
| <ul style="list-style-type: none"> • USA model
Serial number, up to 10140 CND model
Serial number, up to 20010 | } | RS-6
board |
| <ul style="list-style-type: none"> • USA model
Serial number, 10141 to 19910 CND model
Serial number, 20011 to 20710 | } | MR-6
board |
| <ul style="list-style-type: none"> • USA model
Serial number, 19911 and later CND model
Serial number, 20711 and later | } | MR-11
board |



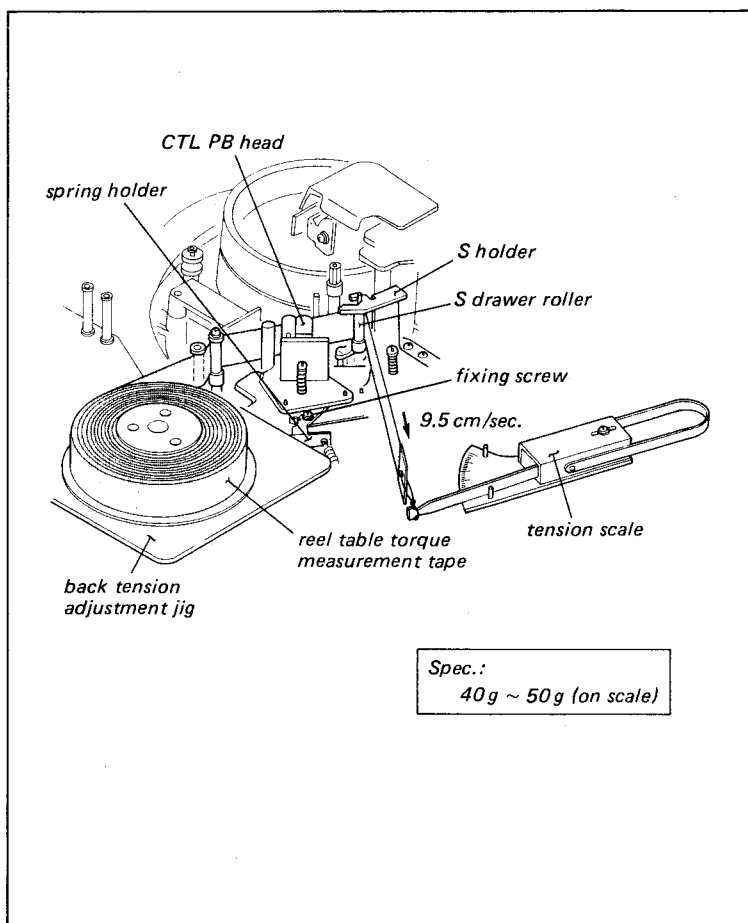
6-5. FF BACK TENSION ADJUSTMENT

- It is required that the sec. 5-6-3 supply tension regulator operating position adj. is checked to be correct or properly adjusted before initiating this adjustment.
- It is required that the sec. 6-6 FWD back tension adj. is performed after this adjustment.

Tool and equipment:

Back tension adjustment jig.
Reel table torque measurement tape
(100 mm dia.)
Tension scale (50 g full scale)

- Preparation:**
- (1) Turn POWER on in FR-STOP mode. (When POWER on, the S drawer roller moves to the FR-STOP position and put the machine into FR-STOP mode automatically.)
 - (2) Turn the pulley of gear box block in the clockwise direction viewing from the front panel with finger so that the S drawer roller places in front of the CTL PB head.
 - (3) Install the back tension adjustment jig.
 - (4) Install the jig tape on the supply reel table and thread the tape as shown in figure. Check that the tape does not curl at the flange of S drawer roller.
 - (5) Turn the pulley in opposite direction in step 2) so that the S drawer roller is engaged with the S holder.
 - (6) Hook a tension scale on an end of tape.



Check procedure:

- (1) Press the FF button and put into FF mode.
- (2) Pull out the tape at the constant speed of approx. 9.5 cm/sec. in the arrow direction. Check that the scale reading meets the required specification.

Adjustment procedure:

- (1) Adjust the position of the spring holder meets the required specification with flat blade screwdriver, 3 mm dia.
- (2) Check that the scale reading meets the required specification once refer to the check procedure.
- (3) Perform sec. 6-6 FWD back tension adjustment.

6-6. FWD BACK TENSION ADJUSTMENT

- It is required that the sec. 5-6-3 supply tension regulator operating position adj. and sec. 6-5 FF back tension adj. are checked to be correct or properly adjusted before initiating this adjustment.

Tool and equipment:

Back tension adjustment jig.
Reel table torque measurement tape
(100 mm dia.)
Tension scale (100 g full scale)

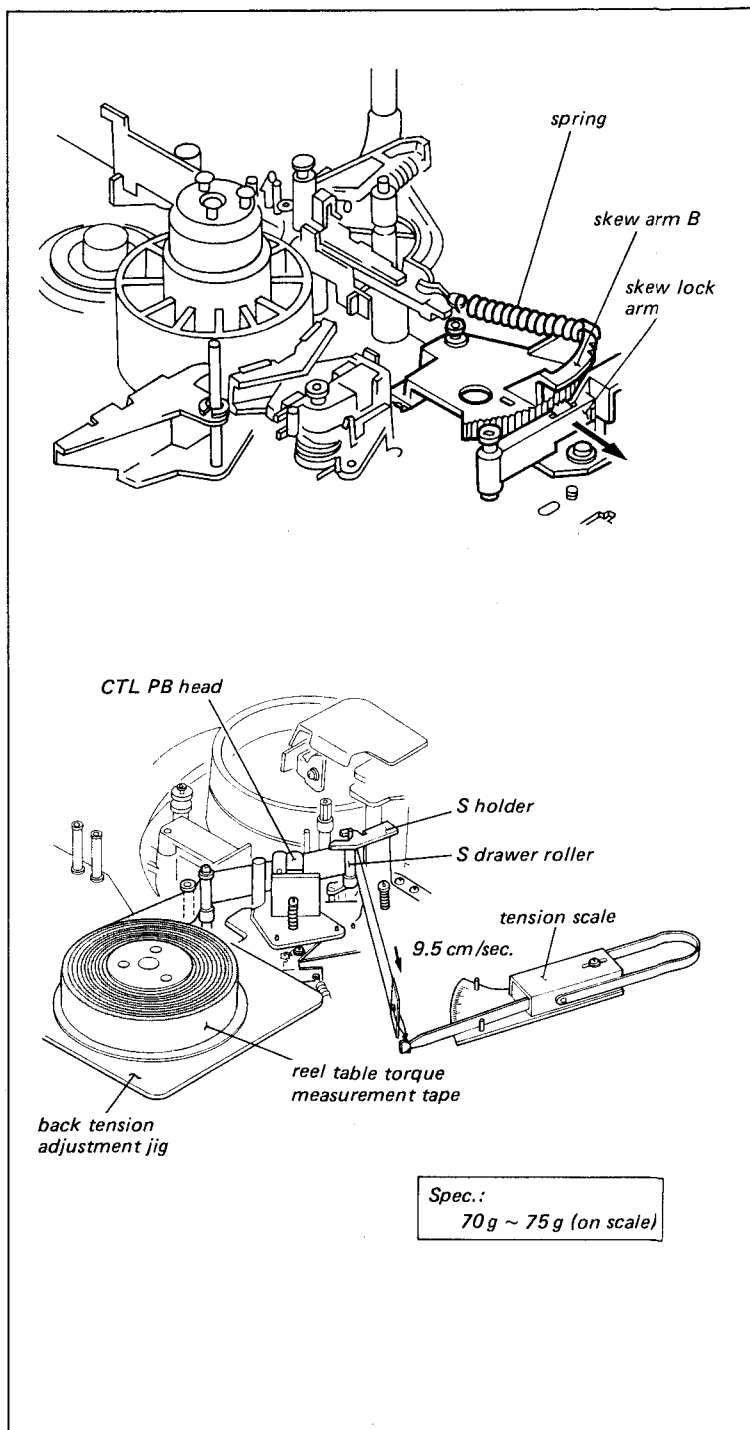
- Preparation:**
- (1) Push the skew arm in the arrow direction.
 - (2) Turn on the POWER and put the machine into the FR-STOP mode. (When turn on the POWER, the S drawer roller moves to the FR-STOP position and put the machine into the FR-STOP mode automatically.)
 - (3) Turn the pulley of gear box block in the clockwise direction viewing from the front panel with finger so that the S drawer roller places in front of the CTL PB head.
 - (4) Install the back tension adjustment jig.
 - (5) Install the jig tape on the supply reel table and thread the tape as shown in figure. Check that the tape does not curl at the flange on S drawer roller.
 - (6) Turn the pulley in opposite direction in step (3) so that the S drawer roller is engaged with the S holder.
 - (7) Hook a tension scale on an end of tape.

Check procedure:

- (1) Press the PLAY button and put into PLAY mode.
- (2) Pull out the tape at the constant speed of approx. 9.5 cm/sec. in the arrow direction. Check that the scale reading meets the required specification.

Adjustment procedure:

- (1) Select the proper spring hook of the skew arm B so that the scale reading meets the required specification.
- (2) After this adjustment, check again refer to check procedure.



SECTION 7

TAPE RUN ALIGNMENT

7-1. FF/REW MODES TAPE PATH ADJUSTMENT

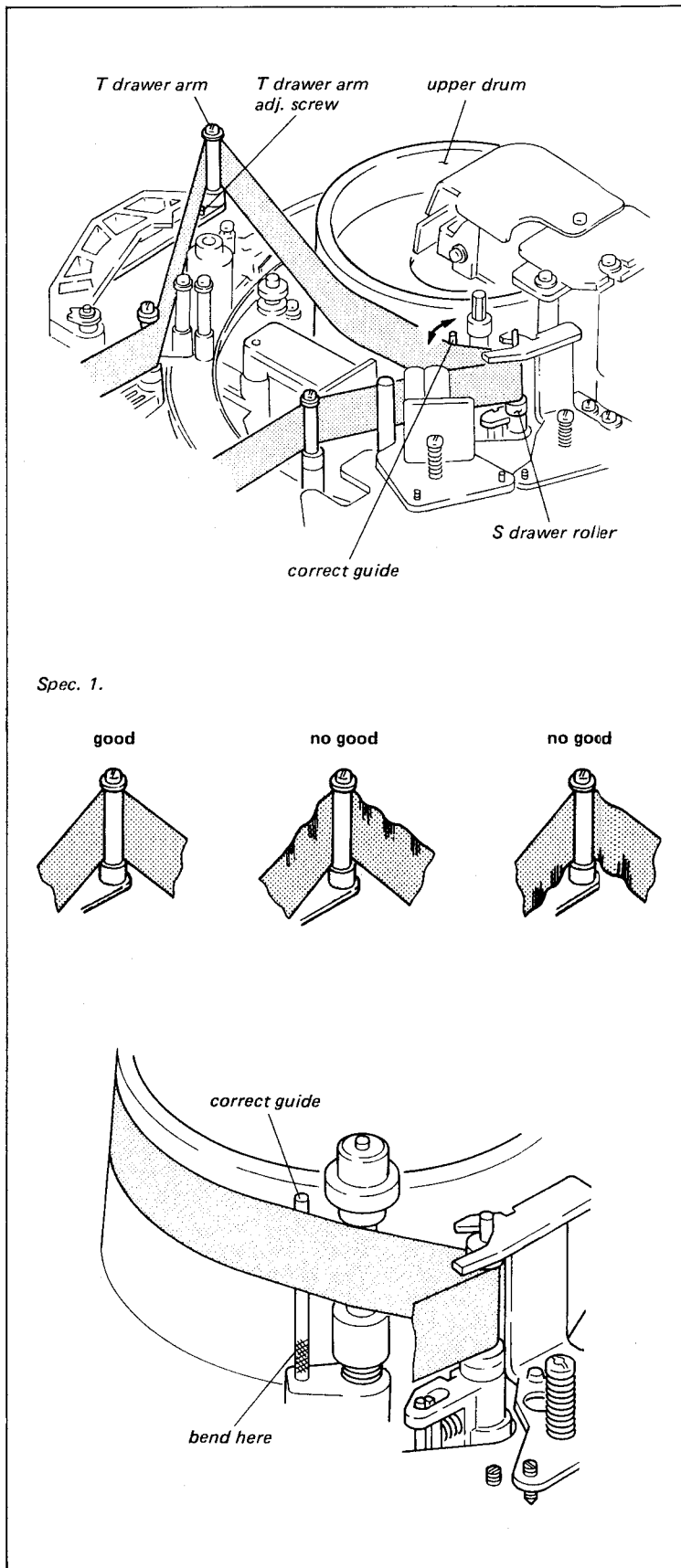
Mode: FF and REW

Check procedure:

- (1) Install KCA-60 cassette tape (after the KCA-60 tape has run after 30 minutes). Put the machine into REW mode.
- (2) Observe the surface of the running tape very carefully around T drawer arm. Check that the tape tension is exactly equal at the tape top and tape bottom. (Spec. 1)
- (3) Check that the tape runs without curl at the upper or lower flange of S drawer roller in the REW mode. (Spec. 2)
- (4) Put the machine once into the STOP mode, and put into the REW mode. Check that the tape runs without curl at the S drawer roller in the moment of just after the REW mode. (Spec. 3)
- (5) Put the machine into FF mode. Check that the tape runs without curl at the S drawer roller and T drawer arm in the moment of just after the FF mode. (Spec. 4)
- (6) Put the machine into FWD mode. Check that the top of the correct guide pin does not contact with the tape and drum. (Spec. 5)

Adjustment procedure:

- Spec. 1**
- (1) Adjust the slantness of T drawer arm by turning the T drawer arm adjusting screw.
- Spec. 2**
- (2) Bend the bottom of the correct guide with pliers in the arrow direction.
- Spec. 3**
- (3) Fine bend the bottom of the correct guide with pliers to satisfies the spec. 2) and 3).
- Spec. 4**
- (4) Fine adjust the slantness of the T drawer arm by turning the T drawer arm adjusting screw to satisfies the spec. 1) and 4).



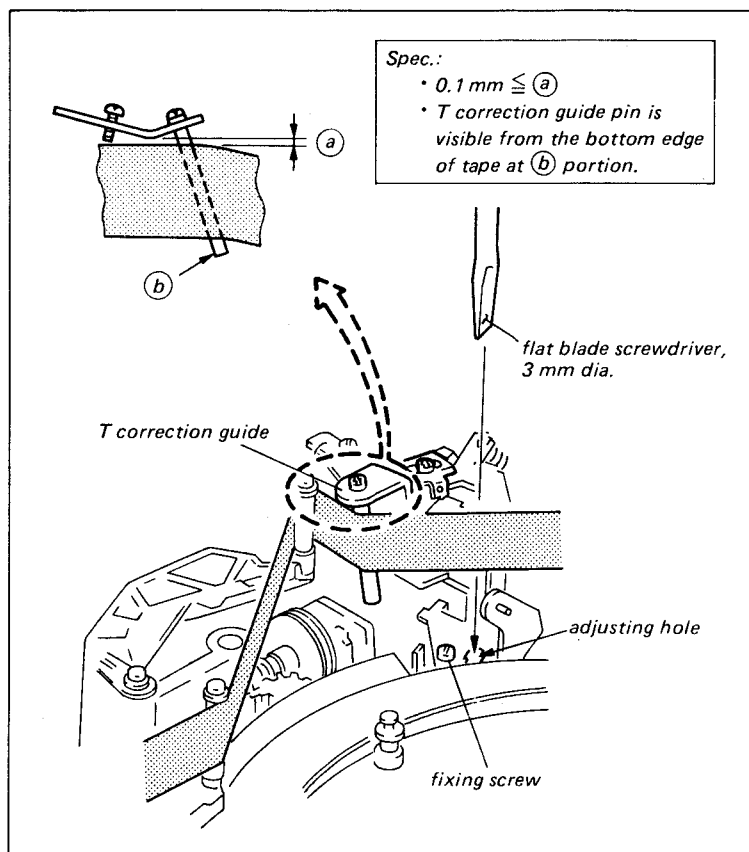
7-2. T CORRECTION GUIDE SLANTNESS ADJUSTMENT

Check procedure:

- (1) Install KCA-60 cassette tape, and put the machine into the FR-STOP mode.
- (2) Press the PLAY button. The threading operation starts. Turn off the POWER when the pinch roller is pathed in front of the T correction guide.
- (3) Check that the clearance between the tape top edge and the upper bracket of T correction guide meets the required specification.

Adjustment procedure:

- (1) Adjust the position of T correction guide with flat blade screwdriver 3 mm dia. meets the required specification.
- (2) After this adjustment, perform sec. 7-3 FWD mode tape path adjustment (1).



7-3. FWD MODE TAPE PATH ADJUSTMENT (1)

- It is required that the sec. 7-2 T correction guide slantness adj. and sec. 7-1 FF/REW modes tape path adj. are checked to be correct or properly adjusted before initiating this adjustment.

Mode: FWD

Check procedure:

- (1) Install KCA-60 cassette tape (after the KCA-60 tape has run after 30 minutes). Put the machine into FWD mode.
- (2) Check that the tape runs without curl at the upper or lower flange of T drawer arm. (Spec. 1)
- (3) Check that the tape tension is exactly equal at the tape top and tape bottom, and the tape runs without curl at the lower flange of T drawer arm. (Spec. 2)

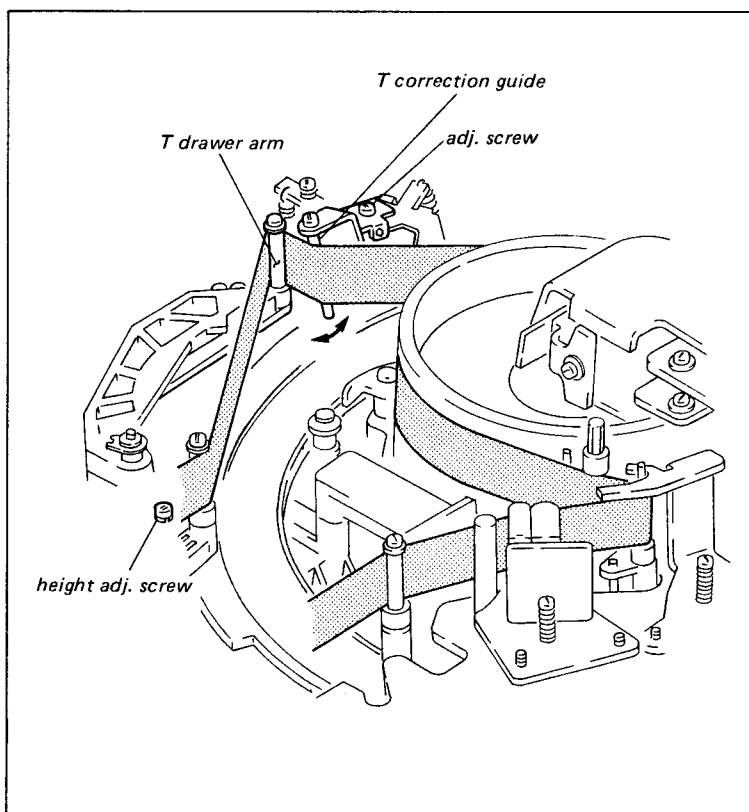
Adjustment procedure:

Spec. 1

- (1) Adjust the height of T drawer arm by turning the T drawer arm height adjusting screw.

Spec. 2

- (2) Adjust the T correction guide in the arrow direction by adjusting screw.



7-4. FWD MODE TAPE PATH ADJUSTMENT (2)

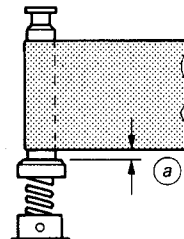
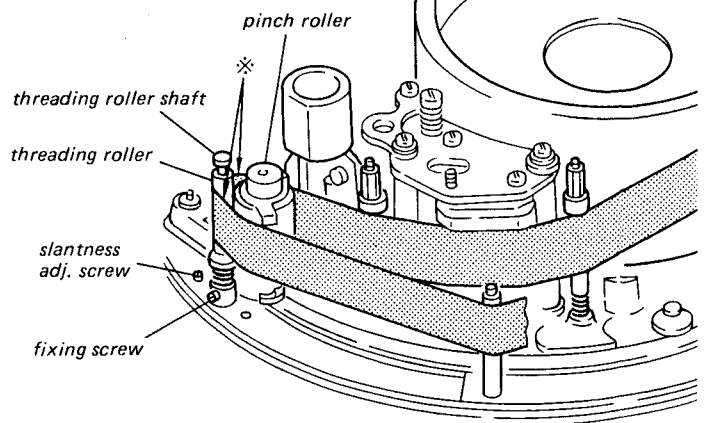
Mode: FWD

Check procedure:

- (1) Install KCA-60 cassette tape (after the KCA-60 tape has run after 30 minutes). Put the machine into FWD mode.
- (2) Check to see carefully two positions indicated by the * mark in figure, check that the tape tension is exactly equal at the tape top and tape bottom. (Spec. 1)
- (3) Check that the clearance between the lower flange of threading roller and the tape bottom edge meets the required specification (2).

Adjustment procedure:

- (1) Loosen the fixing screw in the bottom of the threading roller as shown in figure.
- Spec. 1
- (2) Adjust the slantness of the threading roller by turning the slantness adjusting screw.
- Spec. 2
- (3) Adjust the height of the threading roller by turning the threading roller shaft.
 - (4) Check again that the slantness and height meets the required specification 1) and 2).



Spec. 2:
 $0.01 \text{ mm} \leq \textcircled{a} \leq 0.15 \text{ mm}$

7-5. REV MODE TAPE PATH ADJUSTMENT

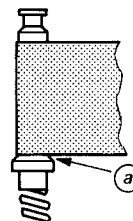
Check procedure:

- (1) Install KCA-60 cassette tape (after the KCA-60 tape has run after 30 minutes).
- (2) Put the machine into REV (x5) mode. Check that the tape runs in contact with the lower flange of the threading roller without curl.
- (3) Put the machine into FWD (x5) mode. Check that the clearance between the lower flange of the threading roller and the tape bottom edge meets the required specification and the tape does not curl at the lower or upper flange of TG-IV.

Adjustment procedure:

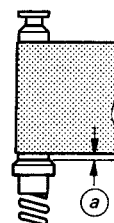
- (1) Fine adjust the height of the threading roller by turning the threading roller shaft.
- (2) After this adjustment, perform sec. 7-4 FWD mode tape path adjustment (2).

< REV (x5) >



Spec.:
The tape runs in contact with $\textcircled{a}$ portion without curl.

< FWD (x5) >



Spec.:
 $0.01 \text{ mm} \leq \textcircled{a} \leq 0.15 \text{ mm}$

7-6. TAPE PATH ADJUSTMENT AROUND PINCH ROLLER

7-6-1. Tape Wrinkle Remove Adjustment

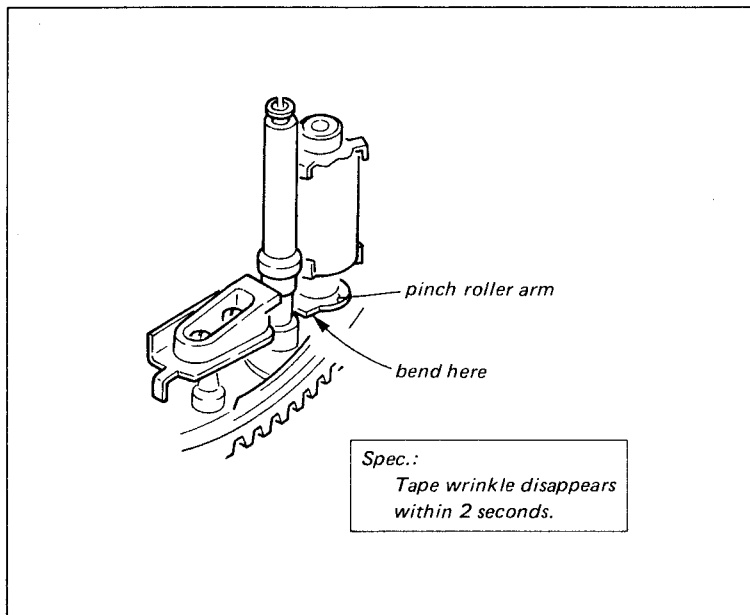
- The first priority of this adjustment is to remove the tape wrinkle around the pinch roller, happening in the moment of just after the pinch roller pressing against the capstan.
- If the tape wrinkle is generated, perform sec. 7-6-2 pinch roller slantness adjustment at first. After this adjustment performed, fine adjust this adjustment once again.

Check procedure:

- (1) Install KCA-60 cassette tape at the tape top portion.
- (2) Put the machine into FWD (x1) mode, REV (x5) mode, repeat REV (x5) and FWD (x5) mode, PAUSE ON/OFF mode in the REC mode, and PAUSE ON/OFF mode in the playback mode. Check that the tape wrinkle does not appear or disappear within specified time when the tape runs toward the specified direction in these modes.

Adjustment procedure:

- (1) Perform sec. 7-6-2 pinch roller slantness adjustment.
- (2) Check the tape wrinkle refer to check procedure. If not, bend the pinch roller arm.

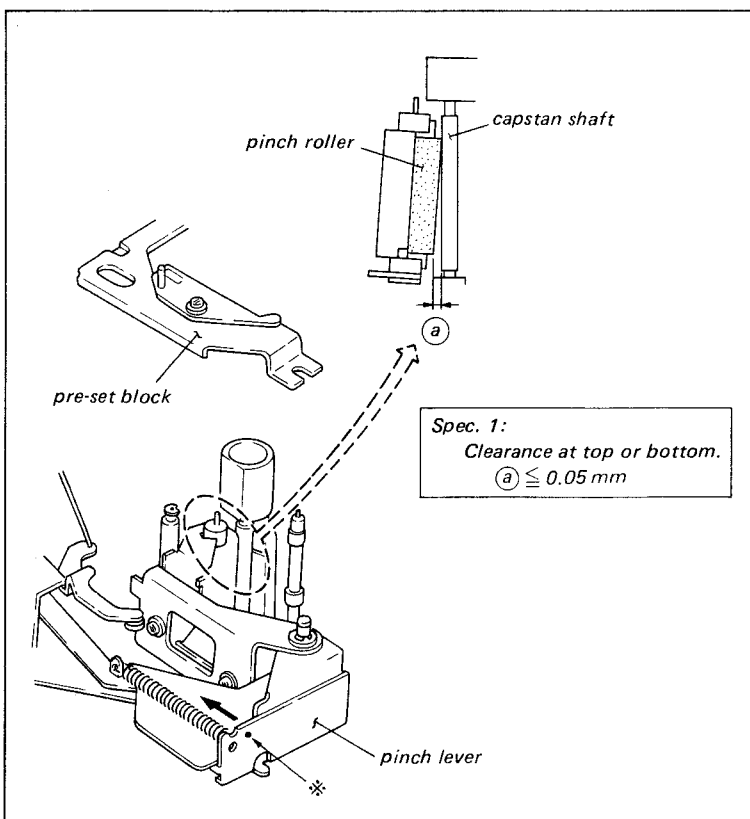


7-6-2. Pinch Roller Slantness Adjustment

Mode: Threading completion mode without cassette tape.

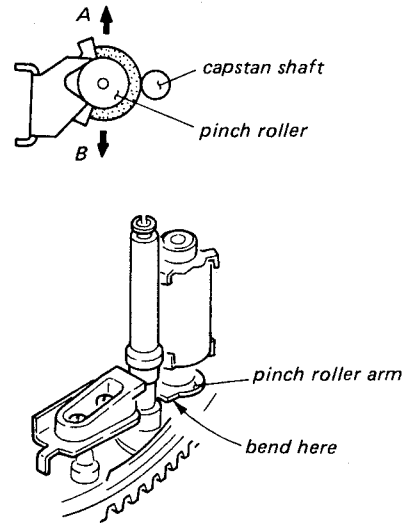
Check procedure:

- (1) Remove the pinch roller pre-set block.
 - (2) Put the machine into the threading completion mode without cassette tape. Turn POWER off.
 - (3) Push lightly the * marked portion of the pinch lever in the arrow direction with finger.
 - (4) When the upper or lower section of the pinch roller came into contact with the capstan shaft. Check that the clearance between the lower or upper section of the pinch roller and the capstan shaft meets the required specification (1).
 - (5) Push lightly the * marked portion of the pinch lever in the arrow direction with finger.
- Just before the pinch roller comes into contact with the capstan shaft, check that the upper section of the pinch roller does not move in the "A" direction nor "B" direction as observed by eye, visually. (Spec. 2)



Adjustment procedure:

- (1) Turn POWER on. The threading ring put into the unthreading operation. Turn POWER off in the moment when the pinch roller comes in front of the audio/CTL head.
- (2) Bend the pinch roller arm.
- (3) Check that the pinch roller slantness meets the required specification referring to check procedure. If not, repeat the foregoing step 2) until the specification 1) and 2) are met.
- (4) Install the pinch roller pre-set bracket, and perform sec. 5-4-2 pinch roller pre-set adj.



7-7. 10 TIMES PICTURE SEARCH · TAPE PATH ADJUSTMENT

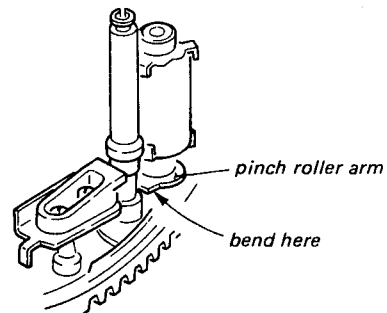
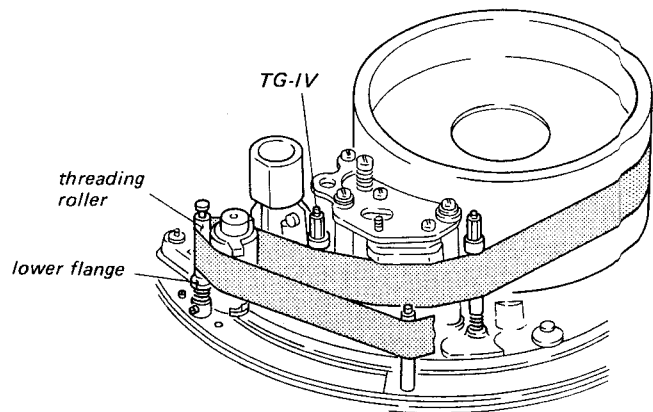
Mode: -10 times picture search
(This mode is set up by using RM-440. If RM-440 is not available, refer to sec. 2-8.)

Check procedure:

- (1) Install KCA-60 cassette tape (after the KCA-60 tape has run after 30 minutes).
- (2) Put the machine into -10 times picture search mode.
- (3) Check that the tape runs in contact with the lower flange of the threading roller without curl and the tape does not curl at the lower and upper flanges of TG-IV.

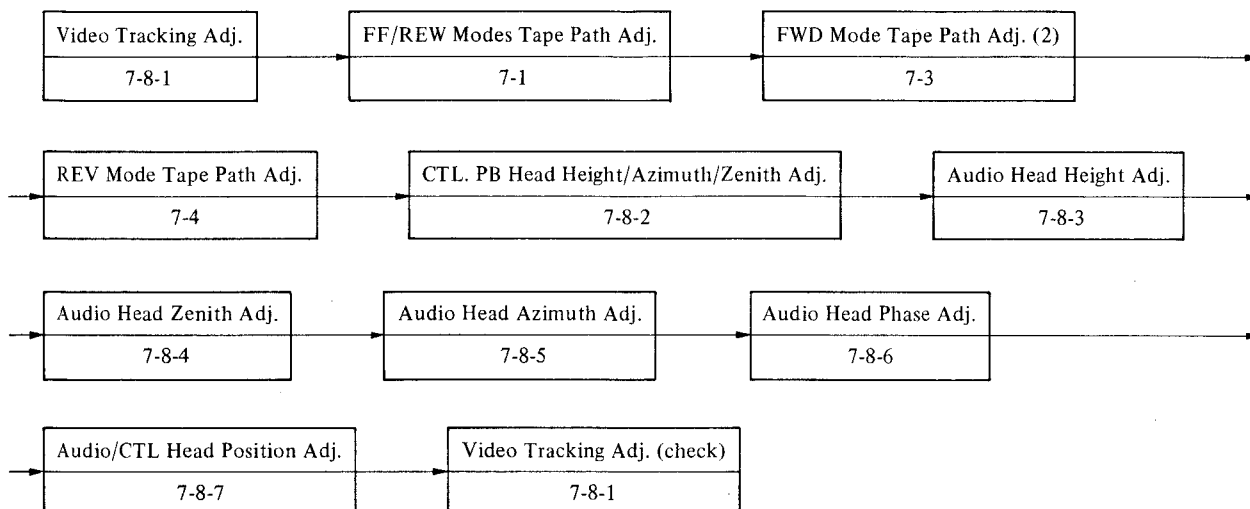
Adjustment procedure:

- (1) Bend the pinch roller arm.



7-8. TRACKING ADJUSTMENT

The tracking adjustment is required to be performed as following steps.



7-8-1. Video Tracking Adjustment

Tool and equipment:

Alignment tape, RR5-2SA
Flatness plate
Oscilloscope

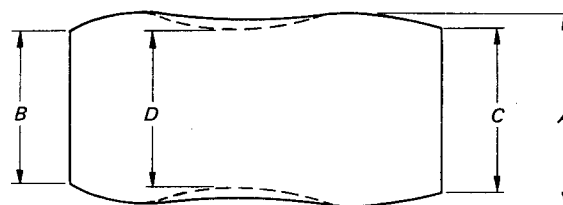
- Preparation:**
- (1) Connect the oscilloscope to TP17/MP-12 board, and EXT.TRIG. from TP11/SV-31 board.
 - (2) Play back the color-bar segment of alignment tape.

Check procedure:

- (1) While observing the waveform on the scope, turn the TRACKING control in both directions noting that the RF waveform maintains a flat envelope while the amplitude increases and decreases.
- (2) Check that the RF envelope fluctuation and head-to-tape contact are within the specification when the TRACKING control set to its center click (detent) position.

Adjustment procedure:

- When the video tracking adjustment is performed, the drum entrance side tape guide's height adjustment is usually not required. But when this guide (TG-II) is replaced or removed, adjust the height of this guide so that the tape runs at the center of this guide without tape runs in contact with upper or lower flange.



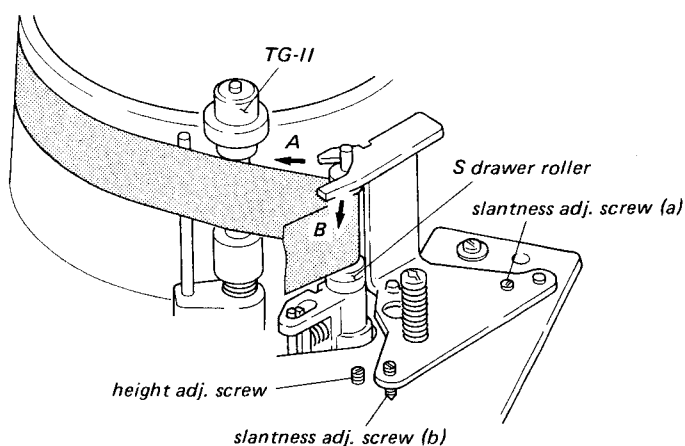
Spec.:

< head to tape contact >

$$\frac{B}{A} \geq 0.70 \quad \frac{C}{A} \geq 0.70$$

< fluctuation >

$$\frac{D}{A} \geq 0.90$$



- S drawer roller unit has three adjusting screws. These three adjusting screws functions as follows.

(i) Slantness adjusting screw (a)
Turning this screw in the clockwise direction, the upper section of S drawer roller slants in the arrow "A" direction.

(ii) Slantness adjusting screw (b)
Turning this screw in the counter clockwise direction, the upper section of S drawer roller slants in the arrow "B" direction.

The RF envelope meets the required specification but tape runs curl at upper flange of S drawer roller, this screw is only used in this manner to remove tape curl.

(iii) Height adjusting screw
Turning this screw in the clockwise direction, makes the height of S drawer roller lower.

- When the drum exit side tape guides (TG-III, TG-IV) adjustment are performed, loosen the locking screw 1 ~ 2 turns and adjust the height by turning the height adjusting nut.

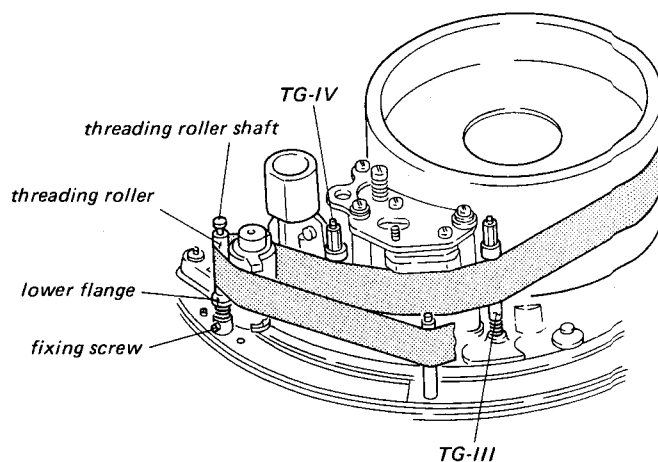
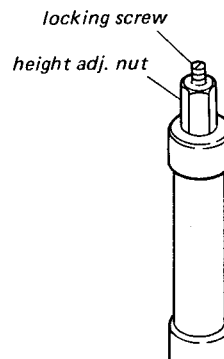
- When the tracking at the drum's input side is no good.

- (1) Set the TRACKING control so that the RF envelope amplitude is made to 70 ~ 80% of the maximum amplitude.
- (2) Adjust height and slantness of S drawer roller by turning the height adjusting screw and slantness adjusting screw (a) so that the RF envelope is flat.

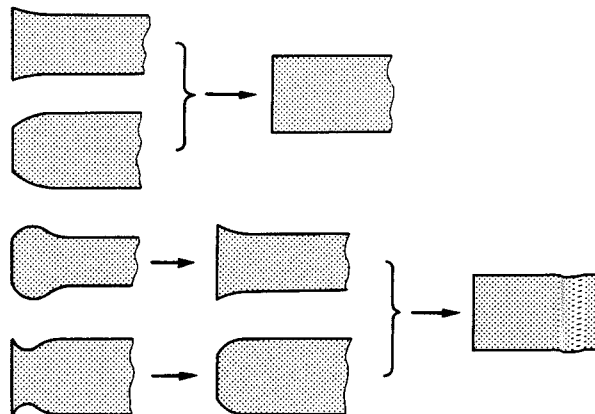
(CAUTION)

- (i) Observe the surface of the running tape very carefully around S drawer roller. Check that the tape tension is exactly equal at the tape top and tape bottom.
 - (ii) Check that the tape runs in contact with the upper flange of S drawer roller without tape curl.
- When the tracking at the drum's center portion is no good. It is required that the drum's input side tracking adjustment to be correctly adjusted before initiating this adjustment.
 - (3) Set the TRACKING control so that the RF envelope amplitude is made to 70 ~ 80% of the maximum amplitude.
 - (4) Adjust height and slantness of S drawer roller by turning the height adjusting screw and slantness adjusting screw (a) so that the RF envelope is flat.

(TG-III)
(TG-IV)

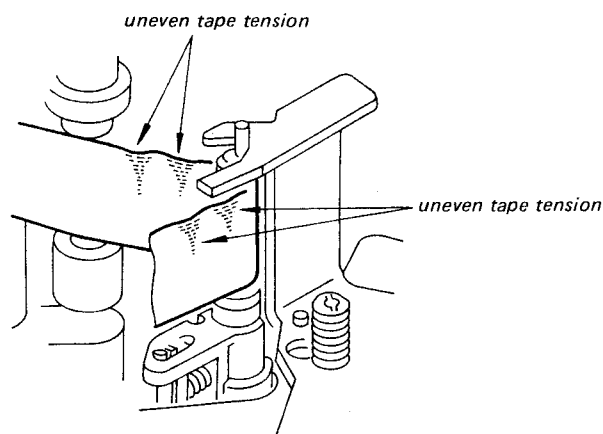
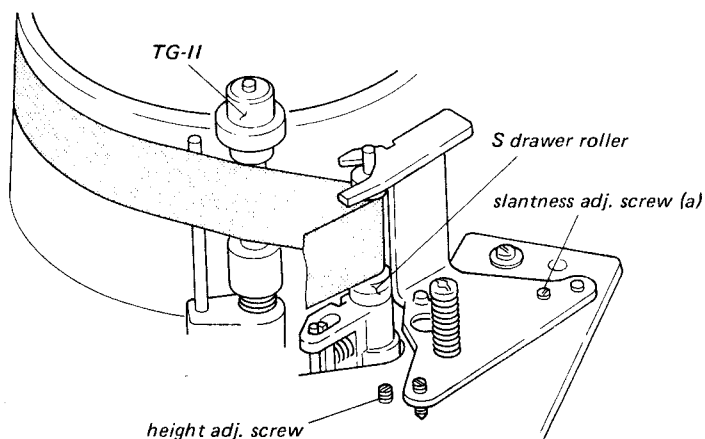


< drum entrance side >

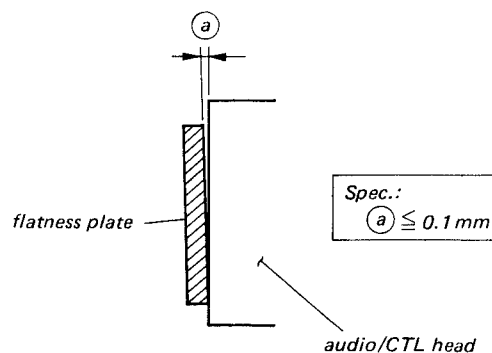


(CAUTION)

- (i) Adjust the slantness adjusting screw (a) in the clockwise within 10 degrees.
- (ii) When the drum's center portion tracking adjustment performs, the drum's input side tracking must maintain to flat.
- (iii) Check that the tape runs in contact with the upper flange of S drawer roller without tape curl.
- (5) When the RF envelope is not flat with step 4), adjust height of TG-III and TG-IV.
- (6) When the RF envelope is not flat with steps 4) and 5), adjust zenith of the audio/CTL head within the allowable range. Adjust height of TG-III and TG-IV once again.
- (7) Check that the clearance between the tape bottom edge and the lower flange of threading roller is 0.01 mm ~ 0.15 mm clearance. If not, perform height adjustment of threading roller by turning the threading roller shaft.

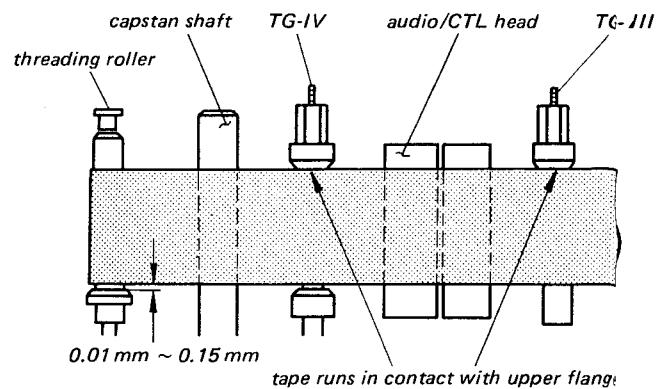
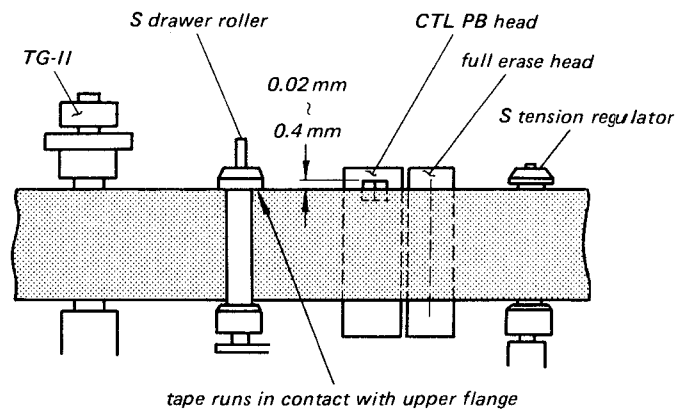
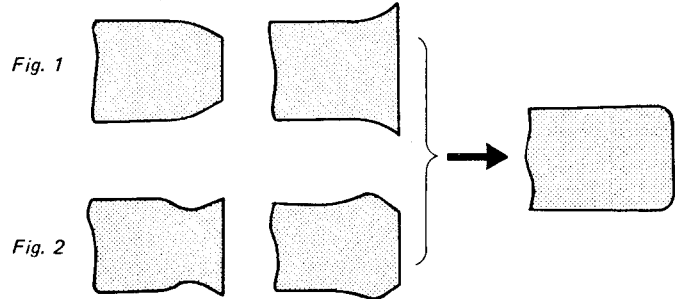


< zenith adj. for audio/CTL head >



- When the tracking at the drum's exit side is no good.
- (8) Set the TRACKING control so that the RF envelope amplitude is made to 70 ~ 80% of the maximum amplitude.
 - (9) When the RF envelope is not flat as shown in figure 1, adjust height of TG-IV so that the RF envelope is flat. After this adjustment, adjust height of TG-III so that the tape runs in contact with upper flange. When the RF envelope is not flat as shown in figure 2, adjust height of TG-III and TG-IV so that the RF envelope is flat. If it does not with this adjustment, adjust the zenith of the audio/CTL head within the allowable range. Adjust the height of TG-III and TG-IV.
 - (10) Check that the clearance between the tape bottom edge and the lower flange of threading roller is 0.01 mm ~ 0.15 mm clearance. If not, perform height adjustment of threading roller by turning the threading roller shaft.

< drum exit side >



TAPE RUN

7-8-2. CTL PB Head Height/Azimuth/Zenith Adjustments

- CTL PB head height, azimuth, and zenith adjustments are closely related. If any one of these three adjustments is attempted, perform the rest of two adjustments at the same time.

Tool and equipment:

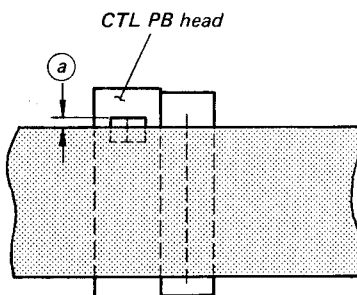
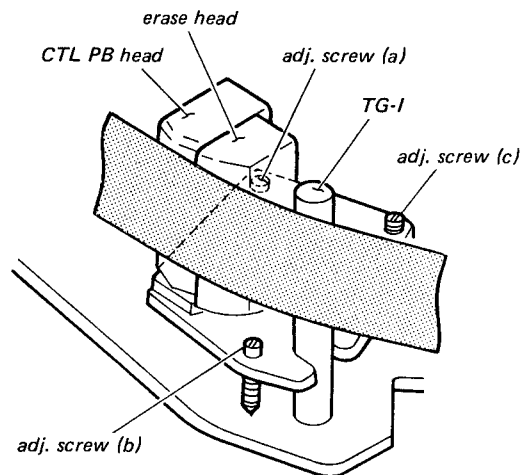
Flatness plate

Check procedure:

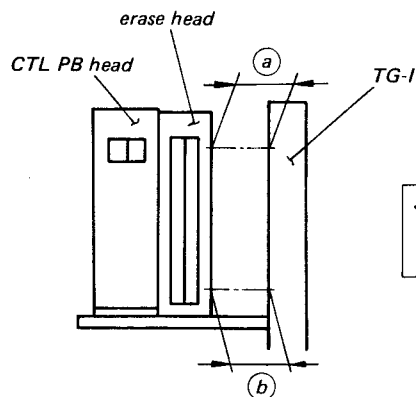
- Check that at the top and bottom clearances between erase head and TG-I meets the required specification. (Spec. 2: Azimuth check)
- Check that the clearance between the erase head and flatness plate meets the required specification, when the flatness plate set on the erase head and TG-I. (Spec. 3: Zenith check)
- Install a cassette tape, and put the machine into FWD mode.
- Check that the relationship between the top edge of tape and CTL PB head meets the required specification. (Spec. 1: Height check)

Adjustment procedure:

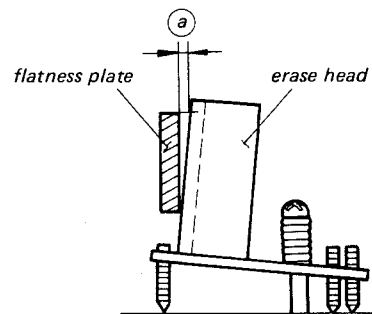
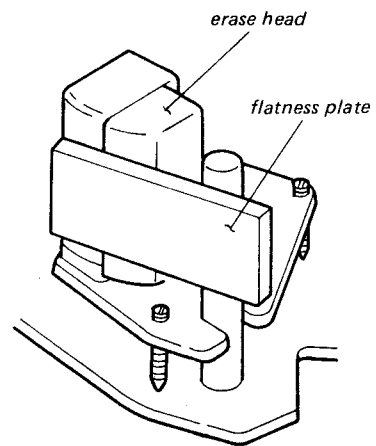
- Adjust the adjusting screw (a) meets the required specification (2).
- Adjust the adjusting screw (b) meets the required specification (3).
- Turn three adjusting screws of exactly equal amount in clockwise or counterclockwise direction so that the relationship between tape and head meets the required specification (1).



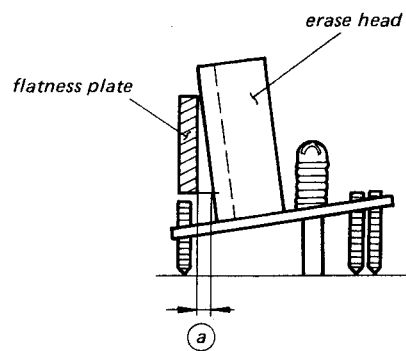
Spec.:
(height)
 $0.02 \text{ mm} \leq \textcircled{a} \leq 0.4 \text{ mm}$



Spec.:
(azimuth)
 $\textcircled{a} \div \textcircled{b}$



Spec.:
(Zenith)
a ≤ 0.1 mm



7-8-3. Audio Head Height Adjustment

Tool and equipment:

Alignment tape, RR5-2SA
VTVM or oscilloscope

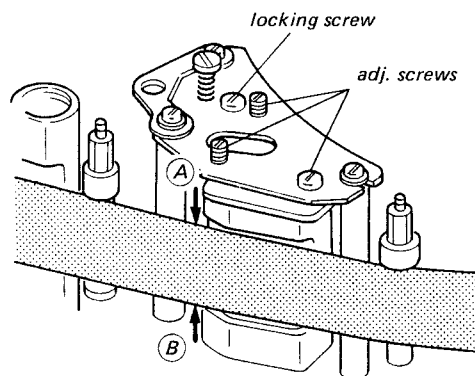
- Preparation:**
- (1) Connect the VTVM or oscilloscope to AUDIO OUT CH-1 and CH-2 terminals.
 - (2) Playback the audio 1 kHz segment of the alignment tape.

Check procedure:

- (1) Check that the CH-1 output level increase is less than 0.5 dB when pressing down at (A).
If not, perform the steps (1) and (2) of the adjustment procedure.
- (2) Check that the CH-2 output level increase is less than 0.5 dB when pushing up at (B).
If not, perform the steps (3) and (4) of the adjustment procedure.

Adjustment procedure:

- (1) Loosen the locking screw and turn adjusting screws (R) and (A) of exactly equal amount in counter-clockwise direction and turn adjusting screw (C) of exactly equal amount in clockwise direction.
- (2) Tighten the locking screw and check height again.
- (3) Loosen the locking screw and turn adjusting screws (R) and (A) of exactly equal amount in clockwise direction and turn the screw (C) of exactly equal amount in counter-clockwise direction.
- (4) Tighten the locking screw and check height again.



Spec.:

- CH-1 level increase is less than 0.5 dB when pressing down at (A) portion.
- CH-2 level increase is less than 0.5 dB when pushing up (B) portion.

7-8-4. Audio Head Zenith Adjustment

Tool and equipment:

Flatness plate

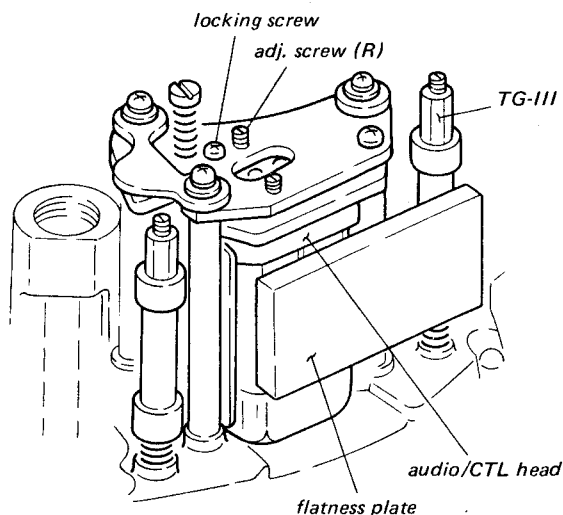
Check procedure:

Check that the clearance between the audio head and the flatness plate meets the required specification, when the flatness plate is set on the audio head and TG-III.

Adjustment procedure:

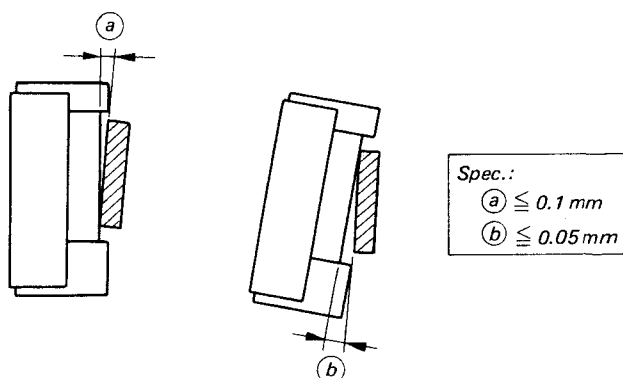
When the clearance is out of spec. at the top portion of the audio head.

- (1) Turn the adjusting screw (R) in counterclockwise direction.
- (2) Tighten the locking screw and check zenith again.



When the clearance is out of spec. at the bottom portion of the audio head.

- (3) Loosen the locking screw $\frac{1}{4} \sim \frac{1}{2}$ turns.
- (4) Turn the adjusting screw (R) in clockwise direction.
- (5) Tighten the locking screw and check zenith again.



7-8-5. Audio Head Azimuth Adjustment

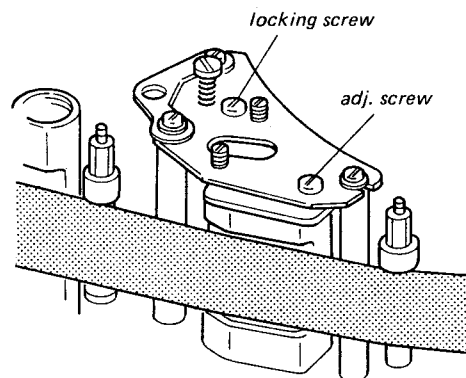
Tool and equipment:

Alignment tape, RR5-2SA
 VTVM or oscilloscope

- Preparation:**
- (1) Connect the VTVM or oscilloscope to AUDIO OUT CH-1 or CH-2 terminal.
 - (2) Playback the audio 10 kHz portion of the alignment tape.

Adjustment procedure:

- (1) Loosen the locking screw and adjust the maximum output level by turning the adjusting screw.
- (2) Tighten the locking screw.



7-8-6. Audio Head Phase Adjustment

Tool and equipment:

Alignment tape, RR5-2SA
Oscilloscope

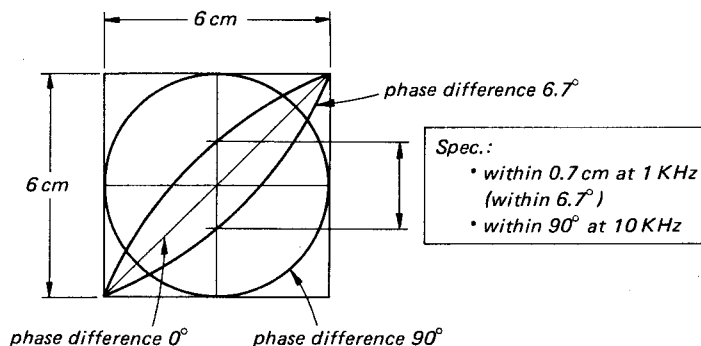
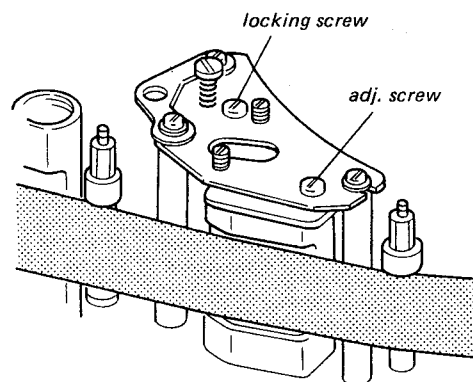
- Preparation:**
- (1) Connect the horizontal and vertical terminals of the oscilloscope to AUDIO OUT CH-1 and CH-2 terminals.
 - (2) Playback the audio 1 kHz portion of the alignment tape.
 - (3) Adjust the scope for horizontal and vertical amplitudes of 6 cm of a lissajous waveshape.

Check procedure:

Check that the vertical amplitude at the center in the horizontal direction is within the specification at 1 kHz and 10 kHz.

Adjustment procedure:

- (1) Loosen the locking screw $\frac{1}{4} \sim \frac{1}{2}$ turns and adjust the phase by turning the adjusting screw.
- (2) Tighten the locking screw and confirm phase again.



7-8-7. Audio/CTL Head Position Adjustment

Tool and equipment:

Alignment tape, RR5-2SA
Oscilloscope

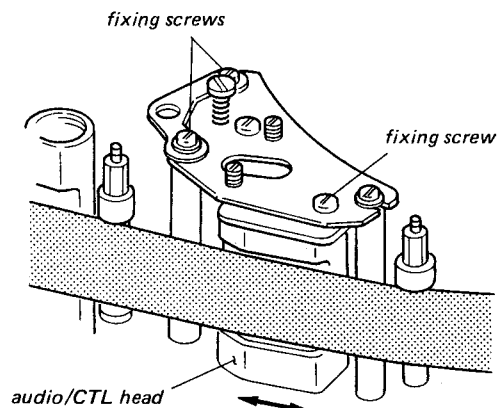
- Preparation:**
- (1) Connect the oscilloscope to TP17/MP-12 board, EXT.TRIG. from TP11/SV-31 board.
 - (2) Playback the color-bar segment of the alignment tape.

Check procedure:

- (1) Check that the RF envelope has the maximum amplitude when the TRACKING control is set in the detent position.

Adjustment procedure:

- (1) Adjust the position of the audio/CTL head.



7-9. VIDEO HEAD DIHEDRAL ADJUSTMENT

Tool and equipment:

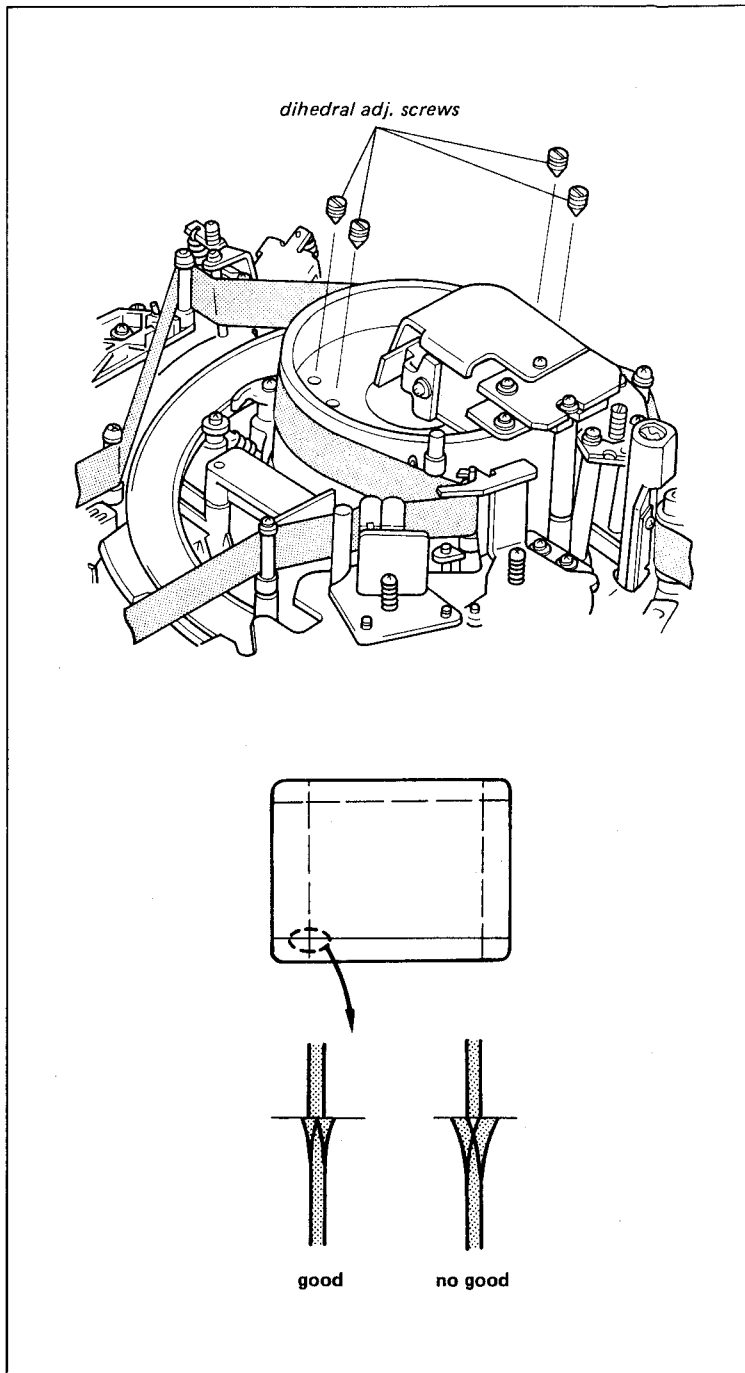
Dihedral adjusting screw
Alignment tape, RR5-2SA
Video monitor

Check procedure:

Check that the vertical line beneath the switching point. If the vertical line does not split into two lines, no adjustment is necessary.

Adjustment procedure:

- (1) Screw lightly four dihedral adjusting screws into the upper drum.
- (2) Turn either of the two screws adjacent to the video head with white leads until some resistance is felt.
- (3) If this screw is turned further, the video head is moved and the dihedral is adjusted. Therefore, turn this screw an additional quarter turn.
- (4) Check for dihedral distortion. If the distortion has gotten worse, turn this screw back one turn and tighten the other screw a quarter turn. Check again for dihedral distortion and continue in this way until dihedral error is eliminated.
- (5) When the adjustment is completed, remove the four dihedral adjusting screws. After removal, playback the alignment tape and check dihedral again as error sometimes reappears after screws are removed.



TAPE RUN

SECTION 8

POWER SUPPLY AND SYSTEM CONTROL ALIGNMENT

8-1. REG 12 V ADJUSTMENT (SWITCHING REGULATOR)

machine conditions for adjustment	spec.	adjustment
• More than 5 minutes should be elapsed after POWER ON. • Any mode.	CN201-1/UR-01 $12.0\text{ V} \pm 0.1\text{ V dc}$	 RV301/PW-68 (UR-01)

NOTE: If the REG 12 V adjustment is attempted, re-alignment of the video system and servo system are required.
 Do not attempt adjustment to the REG 12 V power supply unless machine performance is obviously poor due to incorrect power supply voltage. If adjustments are made to the power supply, re-alignment of the video and servo systems are necessary.

8-2. REG 5 V ADJUSTMENT FOR SYSTEM CONTROL

machine conditions for adjustment	spec.	adjustment
• POWER ON. • STOP mode.	TP2/SY-68 $5.2\text{ V} \pm 0.05\text{ V dc}$	 RV1/SY-68

8-3. TAPE SENSOR BALANCE ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• STOP mode. • Short between CN13-2 and CN13-3 on SY-68 board with jumper lead.	TP11/SY-68 $6.0\text{ V} \pm 0.2\text{ V dc}$	 RV2/SY-68

SECTION 9

SERVO SYSTEM ALIGNMENT

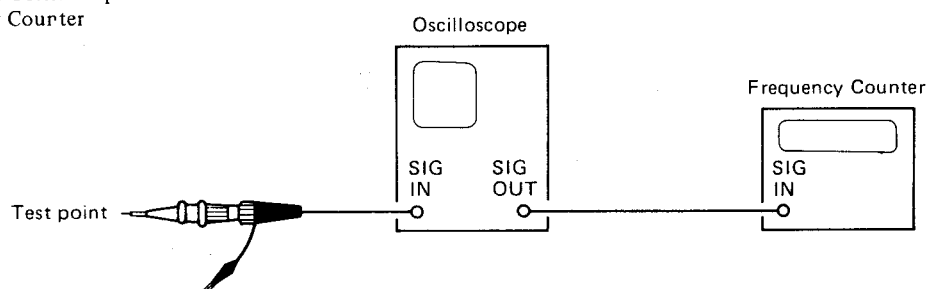
[Equipment Required]

- Alignment Tape; RR5-1S (Part No. 8-960-015-01) or RR5-2SA (Part No. 8-960-015-03).

RR5-2SA

Real Time Counter (min.)	Tape Counter	Video Track	Audio Track
00:00 – 04:00	000 – 100	Monoscope	3 KHz, 0 dB
04:00 – 09:00	100 – 208	Color-bar	_____
09:00 – 14:00	208 – 300	R-F sweep	_____
14:00 – 16:00	300 – 335	Mod. 20T pulse	1 KHz, 0 dB
16:00 – 18:00	335 – 367	M.S. w/burst	10 KHz, –10 dB
18:00 – 20:00	367 – 398	Pseudo C.B. for DOC adj.	_____

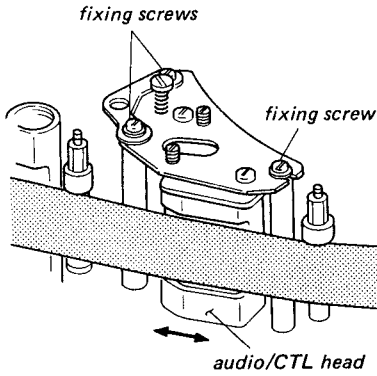
- Blank Tape; KCA-60, KCS-20
- Dual Trace Oscilloscope
- Frequency Counter



9-1. VCC ADJUSTMENT FOR SERVO IC

machine conditions for adjustment	spec.	adjustment
• More than 5 minutes should be elapsed after POWER ON. • STOP (E-E) mode.	TP37/SV-31 5.0 V $\pm$ 0.1 V dc	Ⓐ RV17/SV-31

9-2. AUDIO/CTL HEAD POSITION ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Playing back the color bar segment of Alignment Tape. • Set the TRACKING control to its center detent.	TP17/MP-12 Maximize the RF envelop output level 	Ⓐ Loosen the fixing screws and move the audioCTL head to the arrow direction. TRIG; TP11/SV-31

9-3. TRACKING MULTI ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Playing back the Alignment Tape. • Set the TRACKING control to its center detent.	TP1/SV-31 CHOP mode TP2/SV-31 T = 0	RV1/SV-31 TRIG; TP1/SV-31

9-4. CAPSTAN SEARCH x 1 SPEED ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Playing back the audio 3 kHz segment of Alignment Tape. • SEARCH *FWD x 1 speed.	AUDIO LINE OUT 2870 Hz ~ 2890 Hz	RV15/SV-31

NOTE: *FWD x 1 speed: refer to page 9-4.

9-5. CAPSTAN SEARCH x 1/30 SPEED ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Playing back the audio 3 kHz segment of Alignment Tape. • SEARCH *FWD x 1/30 speed.	TP30/SV-31 16.5 msec. ± 1.0 msec	RV10/SV-31 TRIG; INT

NOTE: *FWD x 1/30 speed: refer to page 9-4.

9-6. CAPSTAN SEARCH x 1/15 SPEED ADJUSTMENT

machine conditions for adjustment	spec. & adjustment
- Temporarily connect (Search x 1/15 mode) - Playing back the Alignment Tape. - PLAY PAUSE mode.	TP30/SV-31 8.3 msec. $\pm$ 0.5 msec. RV11/SV-31 TRIG; INT

9-7. CAPSTAN SEARCH x 1/2 SPEED ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
- Playing back the audio 3 kHz segment of Alignment Tape. - SEARCH *FWD x 1/2 speed.	TP35/SV-31 Adjust RV16/SV-31 so that the transition point of level change from LOW level to HIGH level.	RV16/SV-31

NOTE: *FWD x 1/2 speed: refer to page 9-4.

9-8. DRUM AFC BIAS ADJUSTMENT

machine conditions for adjustment	spec. & adjustment
Alignment Tape Playback and SEARCH STILL modes.	TP6/SV-31 (FWD mode) TP6/SV-31 (SEARCH STILL mode) $T = 0 \pm 0.1 \mu\text{sec.}$ RV8/SV-31 TRIG; INT

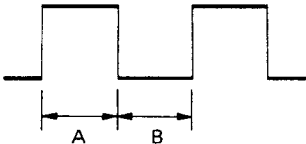
9-9. DRUM AFC TRANSIENT ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
Alignment Tape Playback and SEARCH STILL modes.	TP7/SV-31 SEARCH STILL mode = 2.0 V (REF) FWD mode = (REF) $\pm$ 0.1 V	RV5/SV-31

NOTE: SEARCH mode.

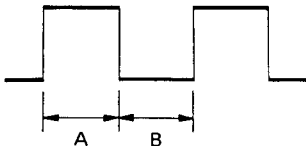
search speed	at TP23/SV-31
search x 1/30 speed	200 Hz $\pm$ 5%
search x 1/10 speed	600 Hz $\pm$ 5%
search x 1/5 speed	1200 Hz $\pm$ 5%
search x 1/2 speed	3 KHz $\pm$ 5%
search x 1 speed	6 KHz $\pm$ 5%
search x 2 speed	12 KHz $\pm$ 5%
search x 5 speed	30 KHz $\pm$ 5%

9-10. CAPSTAN FWD/REV DETECTOR ADJUSTMENT

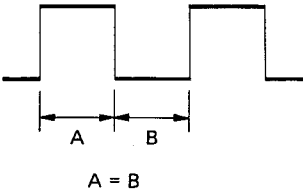
machine conditions for adjustment	spec.	adjustment
- Playing back the Alignment Tape. - SEARCH FWD x 5 speed (SEARCH DIAL fully clockwise)	TP33/SV-31  $A \doteq B$	RV14/SV-31 TRIG; TP33/SV-31

SERVO

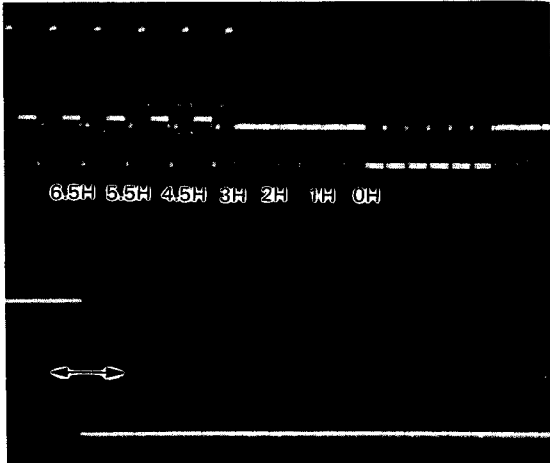
9-11. CAPSTAN FREE SPEED ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
- VIDEO IN; NTSC color video signal. - Record mode.	TP16/SV-31  $A = B$	RV9/SV-31 TRIG; INT

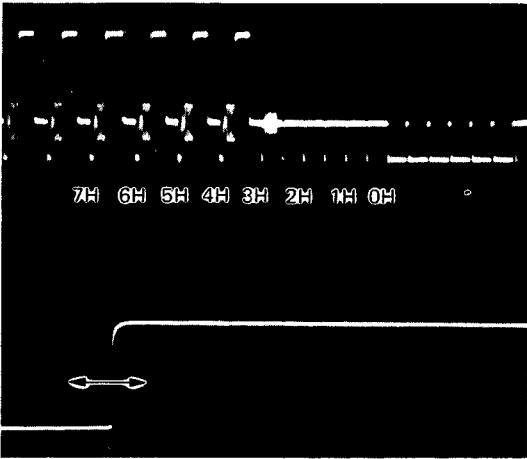
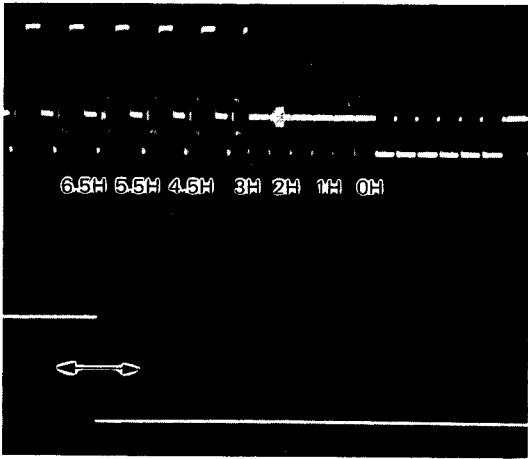
9-12. CAPSTAN STOP SERVO ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; NTSC color video signal. • Record mode.	TP17/SV-31 (STOP SERVO-1) TP18/SV-31 (STOP SERVO-2)  A = B	STOP SERVO-1 ⚙ RV12/SV-31 STOP SERVO-2 ⚙ RV13/SV-31 TRIG; INT

9-13. DRUM ϕ^2 ADJUSTMENT

machine conditions for adjustment	spec. & adjustment
• VIDEO IN; NTSC color video signal. • Short between TP3 and E1 of SV-31 board with jumper lead. • Record mode.	TP5/SV-31 CHOP mode TP11/SV-31  6.5H ± 0.5H ⚙ RV4/SV-31 TRIG; TP1/SV-31

9-14. SWITCHING POSITION ADJUSTMENT

machine conditions for adjustment	spec. & adjustment
• Playing back the color bar segment of Alignment Tape. • Short between TP6 and E1 on SV-31 board with jumper lead.	TP10/DM-22 CHOP mode TP11/SV-31 EVEN Field  6.5H ± 0.5H RV3/SV-31 TP10/DM-22 CHOP mode TP11/SV-31 ODD Field  6.5H ± 0.5H RV2/SV-31 TRIG; TP1/SV-31

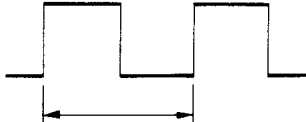
SERVO

9-15. PICTURE SPLITTING COMPENSATOR ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
•Playing back the Alignment Tape.	TP10/SV-31 	RV6. RV7/SV-31 TRIG; TP1/SV-31

9-16. REEL SERVO

9-16-1. x 10 Picture Search Speed Adjustment

machine conditions for adjustment	spec.	adjustment
•Playing back the Alignment Tape. •FWD x 10 Picture Search mode.	TP2/SV-31  3.3 msec. $\pm$ 0.15 msec.	RV3/MR-6 (RS-6) or MR-11 TRIG; INT

NOTE: In x 10 Picture Search mode, the pinch roller is apart from the capstan and the 10 times picture appears on the monitor in FWD and REV SEARCH mode.

** When VTR is operated in x 10 Picture Search mode, RM-440 remote controller is used. At this time, RM-440 SEARCH DIAL is turned fully clockwise (FWD SEARCH mode) or fully counter-clockwise (REV SEARCH mode).
If RM-440 is not available, x 10 Picture Search mode is set up as the following process.

S/N up to 10440 (USA) S/N up to 20110 (CND)	S/N 10441 and later (USA) S/N 20111 and later (CND)
- Temporarily connect 10 kΩ Resistor between IC101-4 and IC23-2 of SY-68 board. - Unsolder between IC101-4 and IC23-2 of SY-68 board. - Short between IC23-2 and E8 of SY-68 board with jumper lead. - Connect 10 kΩ Resistor between IC119-10 and IC25-6 of SY-68 board. - Unsolder between IC119-10 and IC25-6 of SY-68 board. - Short between IC25-6 and E8 of SY-68 board with jumper lead. - Short between CN23-11 and E8 of SY-68 board with jumper lead. - Short between CN22-5 and E8 or +5 V with jumper lead. Short between CN22-5 and E8; REV mode. Short between CN22-5 and +5 V; FWD mode.	- Temporarily connect 10 kΩ Resistor between IC136-4 and IC33-6 of SY-68 board. - Unsolder between IC136-4 and IC33-6 of SY-68 board. - Short between IC33-6 and E8 of SY-68 board with jumper lead. - Connect 10 kΩ Resistor between IC134-3 and IC32-4 of SY-68 board. - Unsolder between IC134-3 and IC32-4 of SY-68 board. - Short between IC32-4 and E8 of SY-68 board with jumper lead. - Short between CN23-11 and E8 of SY-68 board with jumper lead. - Short between CN22-5 and E8 or +5 V with jumper lead. Short between CN22-5 and E8; REV mode. Short between CN22-5 and +5 V; FWD mode.

After x 10 Picture Search Speed is adjusted, the reset circuit is made to original.

9-16-2. Still Speed Adjustment

machine conditions for adjustment	spec.	adjustment
• PAUSE or SEARCH STILL mode	Collector/Q26 on MR-6 or MR-11 board $0.4 \text{ V} \pm 0.1 \text{ V dc}$	⚙ RV4/MR-6 (RS-6) or MR-11

NOTE: FWD torque Adjustment (RV1/MR-6 or MR-11) and REV torque Adjustment (RV2/MR-6 or MR-11).
Refer to Mechanical Alignment Sec. 6-3 and 6-4.

9-17. REC VD ADJUSTMENT

NOTE: 1. Perform adjustments of section 9-13 (Drum ϕ^2) and 9-14 (Switching Position) before this adjustment.
2. Applicable serial No. 18911 and later (USA) (P.C. board part No. 1-603-738-16 and later)
20661 and later (CND)

machine conditions for adjustment	spec. & adjustment
• VIDEO IN; NTSC color video signal. • Record mode.	TP38/SV-31 CHOP mode TP6/SV-31 $T = 0 \pm 5 \mu\text{s}$ RV18/SV-31 TRIG; TP1/SV-31

SECTION 10

AUDIO SYSTEM ALIGNMENT

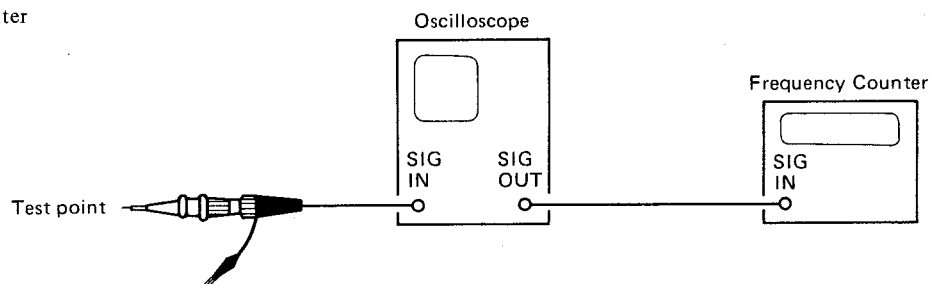
[Equipment Required]

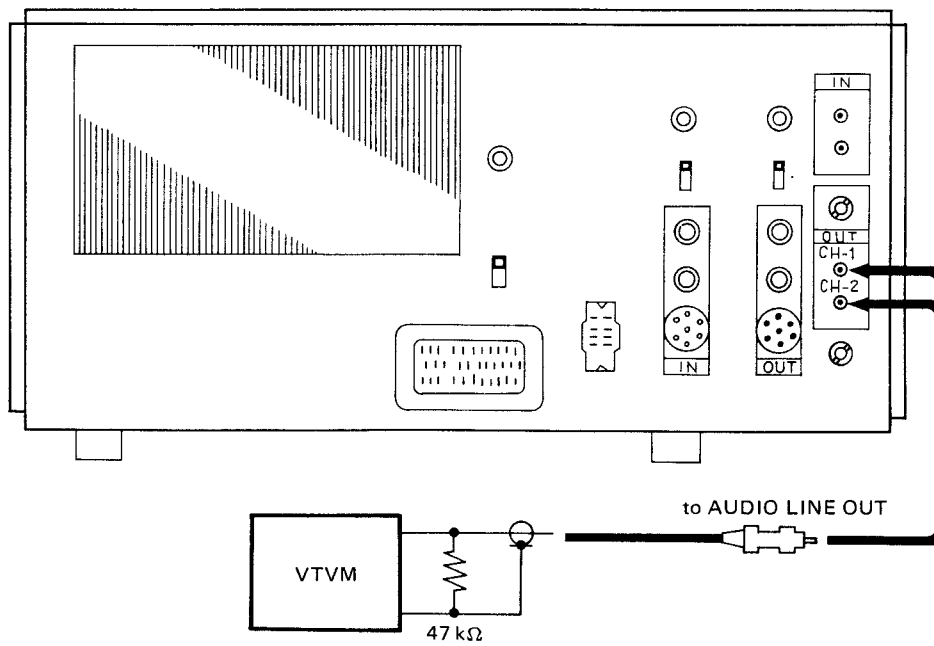
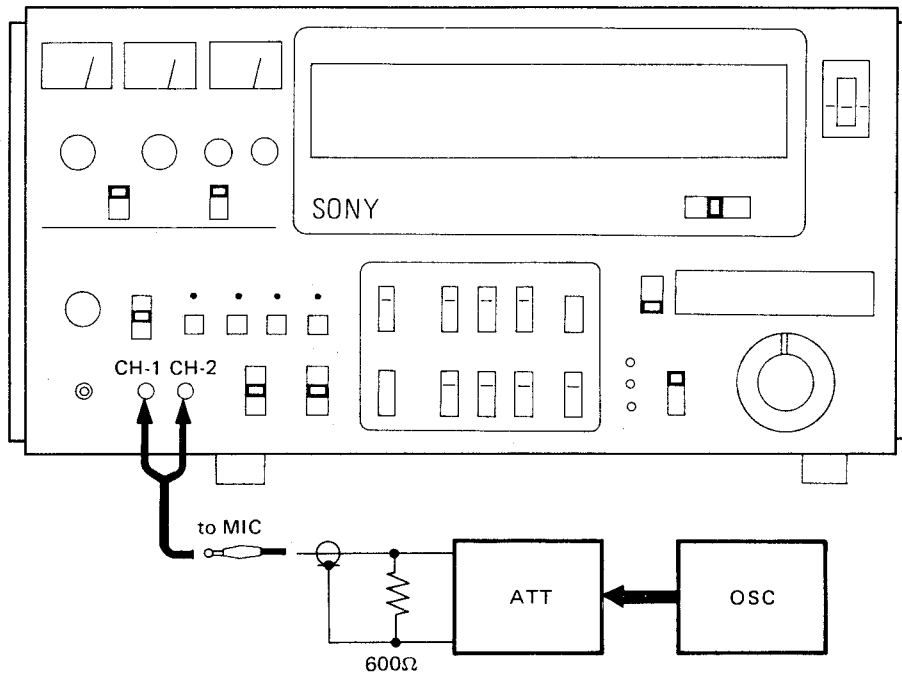
- Alignment Tape; RR5-1S (Part No. 8-960-015-01) or RR5-2SA (Part No. 8-960-015-03).

RR5-2SA

Real Time Counter (min.)	Tape Counter	Video Track	Audio Track
00:00 – 04:00	000 – 100	Monoscope	3 KHz, 0 dB
04:00 – 09:00	100 – 208	Color-bar	_____
09:00 – 14:00	208 – 300	R-F sweep	_____
14:00 – 16:00	300 – 335	Mod. 20T pulse	1 KHz, 0 dB
16:00 – 18:00	335 – 367	M.S. w/burst	10 KHz, –10 dB
18:00 – 20:00	367 – 398	Pseudo C.B. for DOC adj.	_____

- Blank Tape; KCA-60, KCS-20
- Oscilloscope
- Frequency Counter



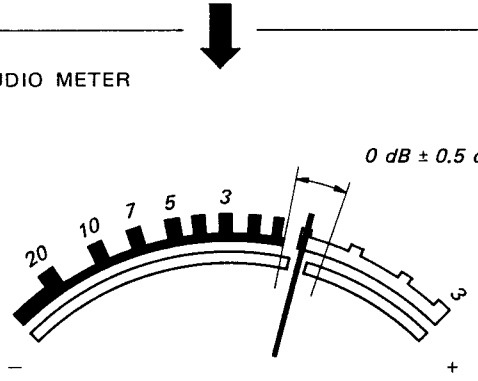


AUDIO

10-1. PB OUTPUT FREQUENCY RESPONSE ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Playing back the 1 kHz and 10 kHz segments of Alignment Tape	LINE OUT (terminated by 47 kohm) (1 kHz Level = Ref. Level) 10 kHz Level = (Ref. Level) - 10 dB $\pm$ 0.5 dB	- RV1/AU-21 (CH-1) - RV201/AU-21 (CH-2)

10-2. "AUDIO LEVEL" CONTROL SETTING/METER CALIBRATION ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• MIC IN; 1 kHz, -60 dB • LIMITER sw; OFF • STOP (E-E) mode.	LINE OUT (terminated by 47 kohm) -5 dB $\pm$ 0.5 dB (CH-1 = CH-2)	AUDIO LEVEL VR (CH-1/CH-2)
	AUDIO METER 	- RV4/AU-21 (CH-1) - RV204/AU-21 (CH-2)

NOTE: The AUDIO LEVEL control should not be touched until rest of Sec. 10 Audio System Alignment are completed.

10-3. PB OUTPUT LEVEL ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Playing back the 1 kHz segment of Alignment Tape	LINE OUT (terminated by 47 kohm) -5 dB $\pm$ 0.5 dB (CH-1 = CH-2)	- RV2/AU-21 (CH-1) - RV202/AU-21 (CH-2)

10-4. AUDIO BIAS, ERASE FREQUENCY ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• AUDIO IN; no signal input. • Record mode.	TP503/AU-21 71 kHz $\pm$ 0.1 kHz	LV501/AU-21

10-5. AUDIO BIAS CURRENT ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• MIC IN; 1 kHz/10 kHz, -80 dB. • Record and Playback mode.	LINE OUT (terminated by 47 kohm) $\left(\begin{matrix} 10 \text{ kHz} \\ \text{REC/PB LEVEL} \end{matrix} \right) = \left(\begin{matrix} 1 \text{ kHz} \\ \text{REC/PB LEVEL} \end{matrix} \right) \pm 0.5 \text{ dB}$ • Increasing the BIAS voltage by 1 V (rms) (measured at TP501/AU-21 for CH-1, TP502/AU-21 for CH-2) corresponds to the decrease of 0.4 dB of the 10 kHz REC/PB level.	⑦ CV501-A/AU-21 (CH-1) ⑦ CV501-B/AU-21 (CH-2)

10-6. BIAS TRAP ADJUSTMENT [REC]-1

machine conditions for adjustment	spec.	adjustment
• AUDIO IN; no signal input. • Record mode.	TP4/AU-21 (CH-1) TP204/AU-21 (CH-2) Adjust for minimum signal amplitude.	⑦ LV3/AU-21 (CH-1) ⑦ LV203/AU-21 (CH-2)

10-7. BIAS TRAP ADJUSTMENT [REC]-2

machine conditions for adjustment	spec.	adjustment
• AUDIO IN; no signal input. • Record mode.	TP1/AU-21 (CH-1) TP201/AU-21 (CH-2) Adjust for minimum signal amplitude.	⑦ LV1/AU-21 (CH-1) ⑦ LV201/AU-21 (CH-2)

10-8. AUDIO LIMITER GAIN ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• MIC IN; 1 kHz, -30 dB • LIMITER sw; ON • STOP (E-E) mode.	LINE OUT (terminated by 47 kohm) -2 dB $\pm$ 0.5 dB (CH-1 = CH-2)	⑦ RV3/AU-21 (CH-1) ⑦ RV203/AU-21 (CH-2)

10-9. REC LEVEL ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• MIC IN; 1 kHz, -60 dB • LIMITER sw; OFF • Record and Playback mode.	LINE OUT (terminated by 47 kohm) The self record/playback level should be $-5 \text{ dB} \pm 0.5 \text{ dB}$ (The level difference between CH-1 and CH-2 should be less than 0.5 dB) If adjustment is found to be necessary, increase or decrease the E-E signal level at TP5/AU-21 (CH-1) or TP205/AU-21 (CH-2) during E-E mode, by the same signal level as is found to be adjusted in the self record/playback procedure.	⑦ RV5/AU-21 (CH-1) ⑦ RV205/AU-21 (CH-2)

10-10. INSERT BIAS FREQUENCY ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• AUDIO IN; no signal input. • AUDIO INSERT mode. (CH-1/CH-2)	TP503/AU-21 CH-1 INSERT mode (CH-2 OFF) CH-2 INSERT mode (CH-1 OFF) $71 \text{ kHz} \pm 0.2 \text{ kHz}$	⑦ LV502/AU-21 (CH-1) ⑦ LV503/AU-21 (CH-2)

10-11. INSERT BIAS TRAP ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• Using a blank tape that has no audio pre-recording. • AUDIO INSERT mode. (CH-1/CH-2)	TP202/AU-21 (CH-2) CH-1 INSERT mode (CH-2 OFF) Minimize the signal amplitude (bias leak).	⑦ LV202/AU-21 (CH-2)
	TP2/AU-21 (CH-1) CH-2 INSERT mode (CH-1 OFF) Minimize the signal amplitude (bias leak)	⑦ LV2/AU-21 (CH-1)

10-12. CROSS-TALK CANCEL ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
● MIC IN; 5 kHz, -60 dB. ● Using an audio blank tape. ● AUDIO INSERT mode. (CH-1/CH-2)	LINE OUT (CH-2) CH-1 INSERT mode (CH-2 OFF) Minimize the signal amplitude (cross-talk)	 RV6/AU-21 (CH-1)
	LINE OUT (CH-1) CH-2 INSERT mode (CH-1 OFF) Minimize the signal amplitude (cross-talk)	 RV206/AU-21 (CH-2)

SECTION 11

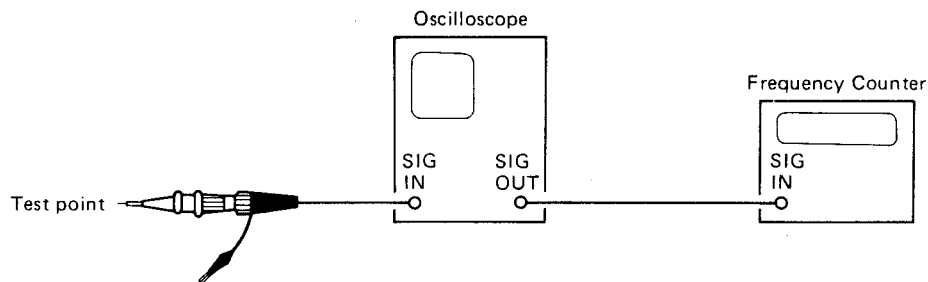
VIDEO SYSTEM ALIGNMENT

[Equipment Required]

- Dual Trace Oscilloscope
- Frequency Counter
- Video Sweep Generator (with Burst)
- Blank Tape; KCA-60 (SONY standard product)
- Alignment Tape; RR5-1S (Part No. 8-960-015-01) or RR5-2SA (Part No. 8-960-015-03).

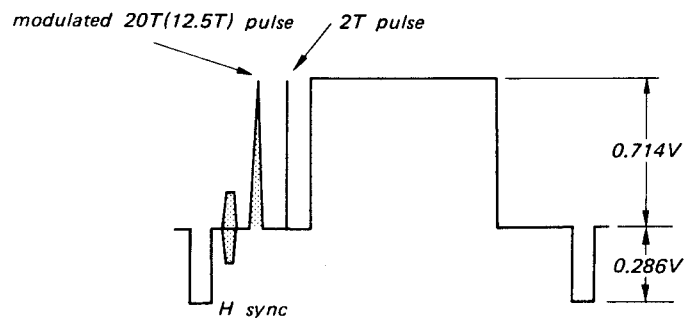
RR5-2SA

Real Time Counter (min.)	Tape Counter	Video Track	Audio Track
00:00 – 04:00	000 – 100	Monoscope	3 KHz, 0 dB
04:00 – 09:00	100 – 208	Color-bar	_____
09:00 – 14:00	208 – 300	R-F sweep	_____
14:00 – 16:00	300 – 335	Mod. 20T pulse	1 KHz, 0 dB
16:00 – 18:00	335 – 367	M.S. w/burst	10 KHz, -10 dB
18:00 – 20:00	367 – 398	Pseudo C.B. for DOC adj.	_____

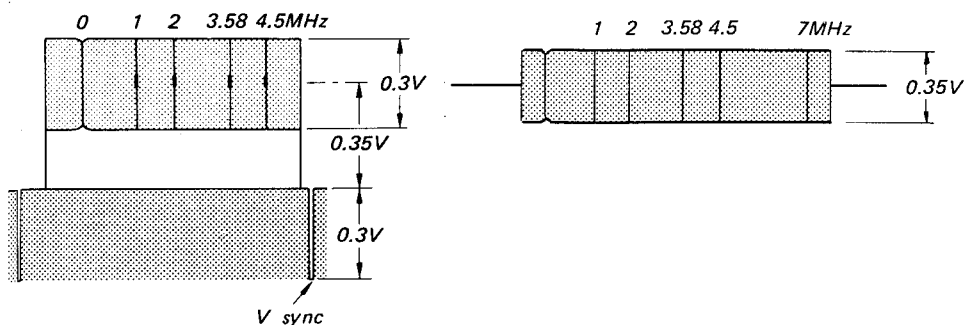


[Video Signals Required]

- Color Bar Signal; 75% color bar signal
- NTSC Color Video Signal; Any video signal that has the NTSC specified subcarrier and sync signals.
- Sin^2 wave signal;



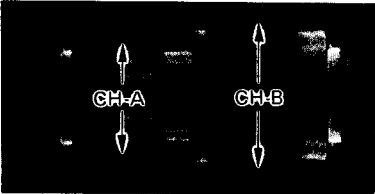
- Gated Sweep Signal;
- Sweep Signal;



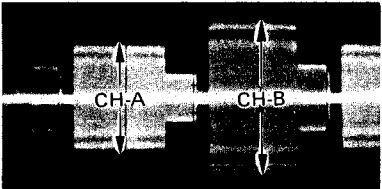
11-1-1. PB RF Frequency Response Adjustment

VIDEO

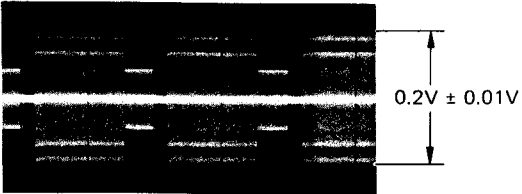
11-1-2. PB Y-RF Output Balance Adjustment

machine conditions for adjustment	spec.	adjustment
•Playing back the color bar segment of Alignment Tape. •Set the TRACKING control to its center detent.	TP17/MP-12  CH-A Level = CH-B Level	RV16/MP-12 TRIG; TP1/SV-31

11-1-3. PB Chroma-RF Output Balance Adjustment

machine conditions for adjustment	spec.	adjustment
•Playing back the color bar segment of Alignment Tape. •Set the TRACKING control to its center detent.	TP14/DM-22  CH-A Level = CH-B Level	RV20/MP-12 TRIG; TP1/SV-31

11-1-4. PB Chroma-RF Output Level Adjustment

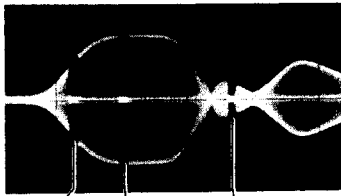
machine conditions for adjustment	spec.	adjustment
•Playing back the color bar segment of Alignment Tape. •Set the TRACKING control to its center detent.	TP14/DM-22 	RV18/MP-12 TRIG; TP1/SV-31

NOTE: Don't use the alignment tape RR5-1S.

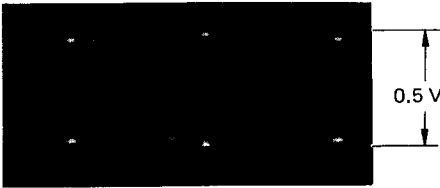
11-1-5. Chroma-RF Bias Trap Adjustment

machine conditions for adjustment	spec.	adjustment
• Playing back the blank tape. • AUDIO CH-1 INSERT mode.	TP24/MP-12  Minimize the amplitude	⚙️ LV52/MP-12

11-1-6. PB Chroma Frequency Response Adjustment

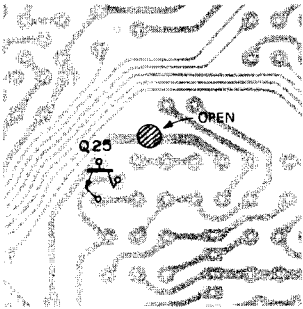
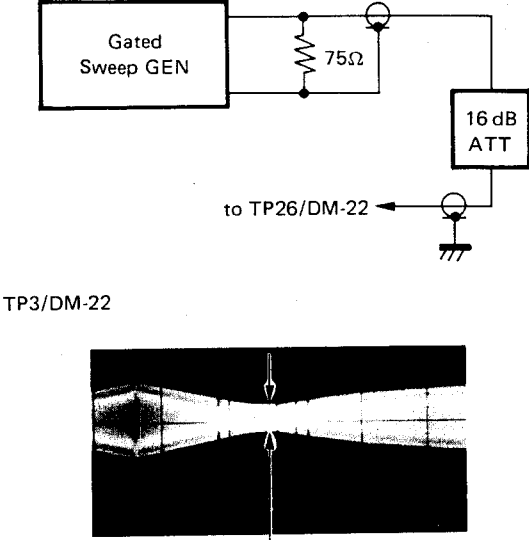
machine conditions for adjustment	spec.	adjustment
• VIDEO IN; Gated Sweep signal (with Burst) • VIDEO LEVEL sw; AUTO • 75Ω sw; ON • Self-Record and then Playback mode.	TP15/DM-22  3.0MHz 3.58MHz 4.5MHz Flatten the waveform between 3.28MHz and 3.88MHz.	⚙️ RV17/MP-12 TRIG; TP1/SV-31

11-1-7. PB Y-RF Output Level Adjustment

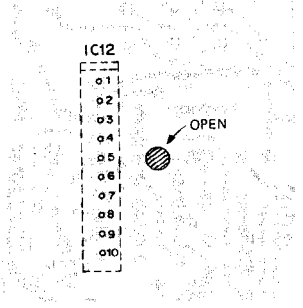
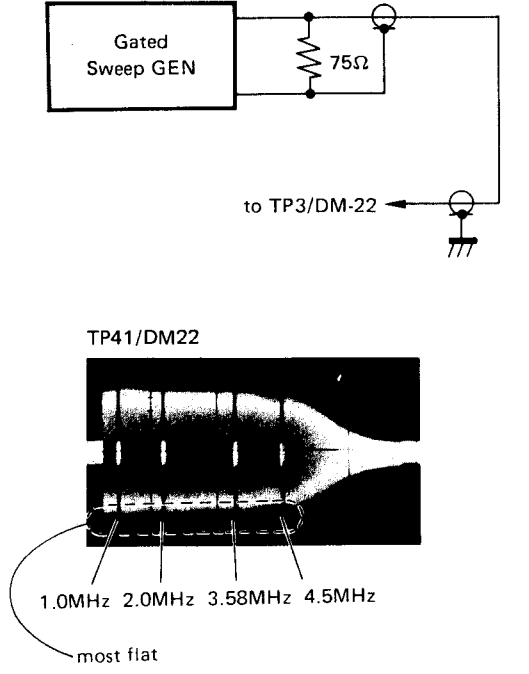
machine conditions for adjustment	spec.	adjustment
• Playing back the color bar segment of Alignment Tape. • Set the TRACKING control to its center detent.	TP17/MP-12  0.5 V ± 0.05 V	⚙️ RV19/MP-12 TRIG; TP1/SV-31

11-2. Y DEMODULATOR ADJUSTMENT

11-2-1. Noise Canceller Adjustment

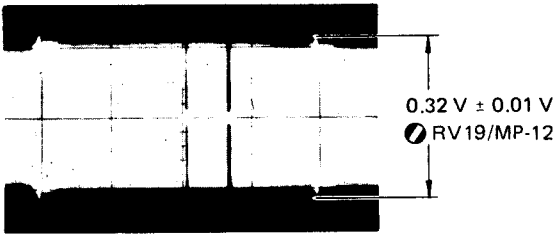
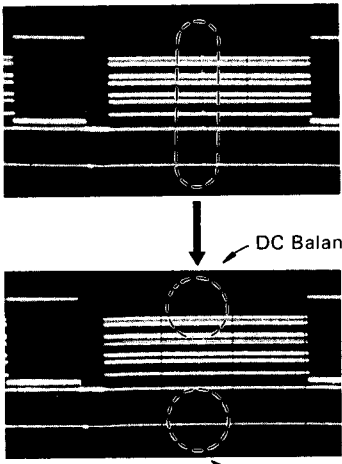
machine conditions for adjustment	spec.	adjustment
●STOP (E-E) mode. ●Set the NOISE CANCEL sw on DM-22 board to SHARP. ●Unsolder the following position on the DM-22 board. 	 TP3/DM-22 Minimize the amplitude of cross point (cross point ; 3.4MHz ± 0.4MHz)	●RV17/DM-22 TRIG; INT

11-2-2. Drop-Out Compensator Frequency Response Adjustment

machine conditions for adjustment	spec.	adjustment
●STOP (E-E) mode. ●Unsolder the following position on the DM-22 board.  ●VIDEO IN; no signal input	 TP41/DM22 1.0MHz 2.0MHz 3.58MHz 4.5MHz most flat	1.0 MHz Adj. ●LV37/DM-22 adjacent to 1.0MHz ●RV19/DM-22 4.0 MHz Adj. ●LV42/DM-22 3.58 MHz Adj. ●CV1/DM-22 NOTE; RV19 DELETED S/N 16211 ~ (USA) S/N 20611 ~ (CND) TRIG; INT

11-2.3. D.O.C. DC Balance and Level Adjustment

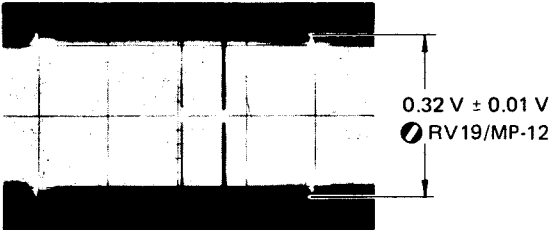
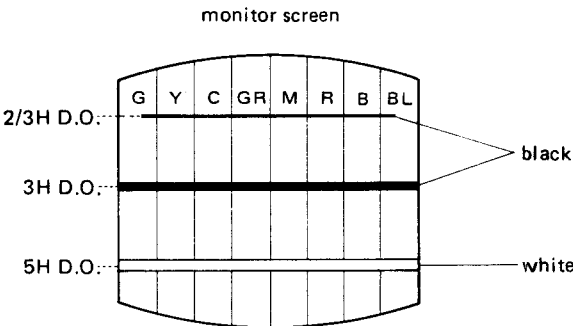
NOTE: Have the unit warmed up for 3 minutes of before adjustment.

machine conditions for adjustment	spec. and adjustment
• Playing back the Pseudo Color-bar segment of Alignment Tape. • Monitor TV sw; B/W TP31/MP-12  0.32 V $\pm$ 0.01 V RV19/MP-12	AT SCOPE TP10/DM-22 3H D. O. Portion  DC Balance Adj. RV61/DM-22 Level Adj. RV22/DM-22 AT MONITOR Adjust the variable resistor RV22 and RV61/DM-22 board repeatedly so that the Drop-Out portion can not be found on the monitor screen, white noise and black noise does not appear at the Drop-Out portion and the H sync does not distort at the Drop-Out portion. TRIG; TP1/SV-31

NOTE: Don't use the Alignment tape RR5-1S.

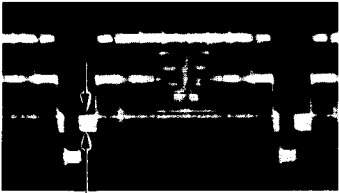
After this adjustment, Reset the Level of TP31/MP-12 ($0.2 \text{ V} \pm 0.02 \text{ V}$) by RV19/MP-12.

11-2.4. Drop-Out Compensator Sensitivity Level Adjustment

machine conditions for adjustment	spec. and adjustment
•Playing back the Pseudo Color-bar segment of Alignment Tape. •Monitor TV sw; color TP31/MP-12  0.32 V $\pm$ 0.01 V RV19/MP-12	AT MONITOR monitor screen  2/3H D.O.: G Y C GR M R B BL 3H D.O.: black 5H D.O.: white Adjust RV22/MP-12 board so that the white noise does not just appear at the right side of the 3H Drop-out portion on the monitor screen.

* After this adjustment, Reset the Level of TP31/MP-12 (0.2 V $\pm$ 0.02 V) by RV19/MP-12.

11-2.5. Carrier Balance Adjustment

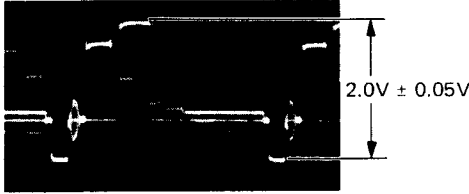
machine conditions for adjustment	spec.	adjustment
•VIDEO IN; B/W video signal. •VIDEO LEVEL sw; AUTO •75Ω sw; ON •STOP (E-E) mode.	TP2/DM-22  Minimize this amplitude (carrier leak)	RV601/MP-12 TRIG; TP8/DM-22

machine conditions for adjustment	spec.	adjustment
● Playing back the color bar segment of Alignment Tape. ● Set the TRACKING control to its center detent.	TP2/DM-22 1.0V ± 0.02V	RV6/DM-22 TRIG; TP1/SV-31

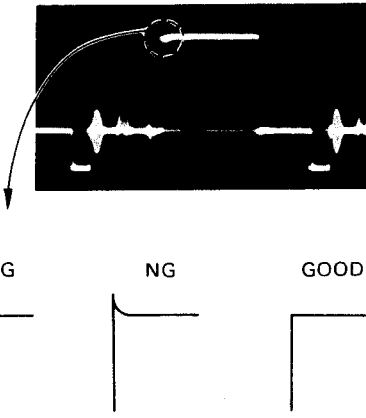
machine conditions for adjustment	spec.	adjustment
● Playing back the color bar segment of Alignment Tape. ● Set the TRACKING control to its center detent.	TP2/DM-22	RV7/DM-22 TRIG; TP1/SV-31

machine conditions for adjustment	spec.	adjustment
● VIDEO IN; NTSC color bar signal. ● VIDEO LEVEL sw; AUTO ● 75Ω sw; ON ● STOP (E-E) mode.	TP3/D_{M-22} The oscilloscope trace shows several horizontal sync pulses. A vertical double-headed arrow indicates the peak-to-peak voltage between two adjacent sync pulses, labeled as 1.0V ± 0.02V.	RV16/D_{M-22} TRIG; TP8/D_{M-22}

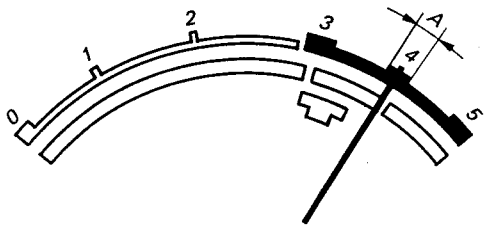
11-2-9. Video Output Level Adjustment

machine conditions for adjustment	spec.	adjustment
•Playing back the color bar segment of Alignment Tape. •Set the TRACKING control to its center detent.	TP10/DM-22 	⌚RV21/DM-22 TRIG; TP8/DM-22

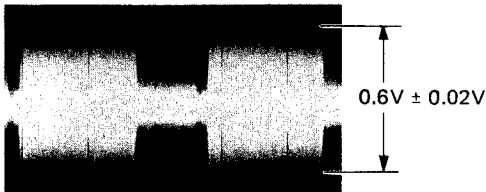
11-2-10. Color-Y Phase Equalizing Adjustment

machine conditions for adjustment	spec.	adjustment
•Playing back the Sin² waveform segment of Alignment Tape. •MONITOR TV sw; B/W	TP3/DM-22 	⌚RV401/DM-22 TRIG; TP8/DM-22

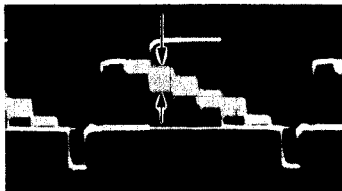
11-2-11. TRACKING Meter Calibration Adjustment

machine conditions for adjustment	spec.	adjustment
•VIDEO IN; NTSC color bar signal. •VIDEO LEVEL sw; AUTO •75Ω sw; ON •Self-Record and then Playback mode.	TRACKING meter 	⌚Adjust RV701/MF.1 2 board that point in "A" region of scale.

11-2-12. 2fc Limiter Level Adjustment

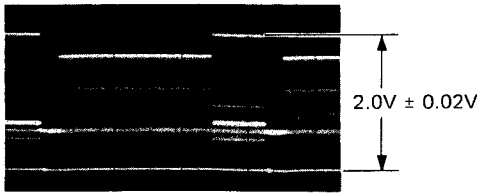
machine conditions for adjustment	spec.	adjustment
● Playing back the color bar segment of Alignment Tape. ● Set the TRACKING control to its center detent.	TP6/DM-22 	⚙ RV18/DM-22 TRIG; TP1/SV-31

11-2-13. 2fc Cancel Adjustment

machine conditions for adjustment	spec.	adjustment
● Playing back the color bar segment of Alignment Tape. ● MONITOR TV sw; B/W	TP11/DM-22  Minimize this amplitude (cyan amplitude)	⚙ RV20/DM-22 TRIG; INT

11-3. Y MODULATOR ADJUSTMENT

11-3-1. FM Deviation Adjustment

machine conditions for adjustment	spec.	adjustment
● VIDEO IN; NTSC color bar signal. ● VIDEO LEVEL sw; AUTO ● 75Ω sw; ON ● STOP (E-E) mode	RV5/MP-12; ↺ fully counterclockwise TP10/DM-22 	⚙ RV2/MP-12 TRIG; TP1/SV-31

11-3.2. Modulator Balance Adjustment

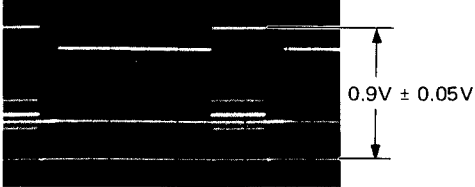
machine conditions for adjustment	spec.	adjustment
•VIDEO IN; no signal input. •STOP (E-E) mode	RV5/MP-12; ↺ fully counterclockwise TP17/MP-12 ; scope CH-A TP17/MP-12 (INVERT); scope CH-B CH-A, CH-B; ALT mode  T = 0	⦿RV3/MP-12 TRIG; INT

NOTE: TRIG SOURCE; NORMAL

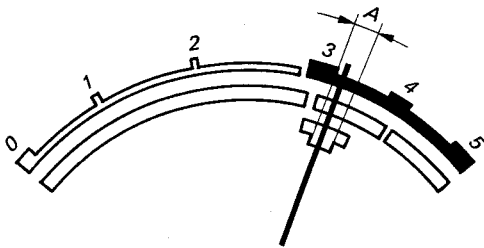
11-3.3. Sync Tip Carrier Frequency Adjustment

machine conditions for adjustment	spec.	adjustment
•VIDEO IN; no signal input •STOP (E-E) mode	TP17/MP-12 3.8 MHz $\pm$ 0.05 MHz	⦿RV4/MP-12

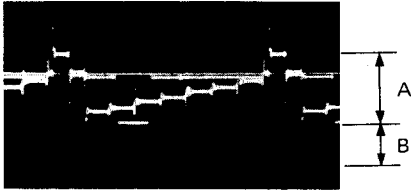
11-3.4. Comb Filter Gain Adjustment

machine conditions for adjustment	spec.	adjustment
•VIDEO IN; NTSC color video signal •VIDEO LEVEL sw; AUTO •75Ω sw; ON •STOP (E-E) mode	TP30/MP-12  0.9V $\pm$ 0.05V	⦿RV64/MP-12 TRIG; TP1/SV-31

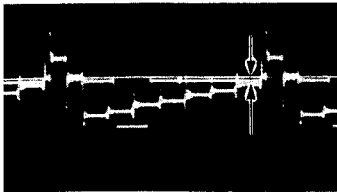
11-3-5. Video Meter Calibration Adjustment

machine conditions for adjustment	spec.	adjustment
● VIDEO IN; NTSC color bar signal. ● VIDEO LEVEL sw; AUTO ● 75Ω sw; ON ● STOP (E-E) mode	VIDEO LEVEL meter 	⌚ Adjust RV702/MP-12 board that point in "A" region of scale.

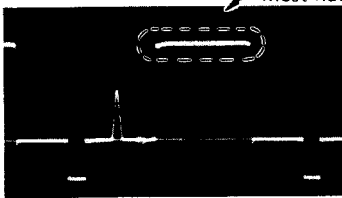
11-3-6. White Clip Adjustment

machine conditions for adjustment	spec.	adjustment
● VIDEO IN; NTSC color bar signal. ● VIDEO LEVEL sw; AUTO ● 75Ω sw; ON ● STOP (E-E) mode ● Short between TP22 and TP23 on MP-12 board with jumper lead.	TP10/MP-12  $A : B = 10 : 5.5$	⌚ RV5/MP-12 TRIG; INT

11-3-7. Color Mode, Y-Channel's 3.58 MHz Trap Adjustment

machine conditions for adjustment	spec.	adjustment
● VIDEO IN; NTSC color video signal. ● VIDEO LEVEL sw; AUTO ● 75Ω sw; ON ● STOP (E-E) mode ● Short between TP22 and TP23 on MP-12 board with jumper lead.	TP10/MP-12  Minimize this amplitude	⌚ LV21/MP-12 TRIG; INT

11-3-8. Smear Compensator Adjustment

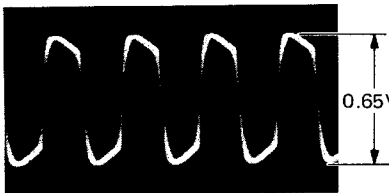
machine conditions for adjustment	spec.	adjustment
• VIDEO IN; Sin² wave signal. • MINOR PRE EM sw on the MP-12 board; OFF • STOP (E-E) mode.	TP3/DM-22 	⚙️ RV401/MP-12 TRIG; TP8/DM-22

11-4. CHROMA DEMODULATOR ADJUSTMENT

11-4-1. 3.58 MHz Reference Oscillator Frequency Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; NTSC color video signal. • STOP (E-E) mode.	TP19/DM-22 3,579,545 Hz $\pm$ 5 Hz	⚙️ T2/DM-22 TRIG; INT

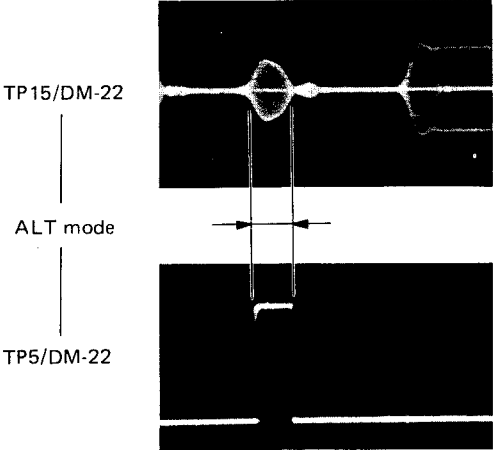
11-4-2. 4.27 MHz Tuning Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; NTSC color video signal. • STOP (E-E) mode.	IC26-1/DM-22 Maximize the amplitude TP29/DM-22 	⚙️ T1, T3/DM-22 TRIG; INT

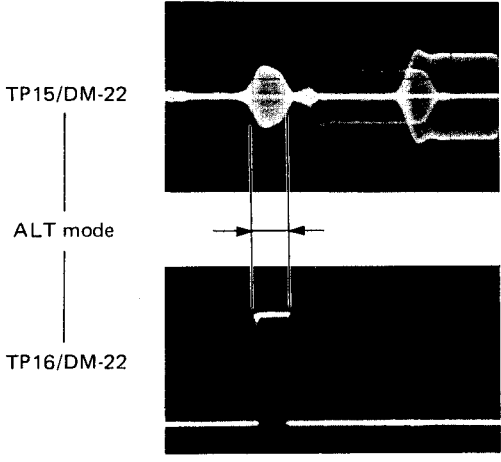
11-4-3. VCO Level Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; NTSC color video signal. • VIDEO LEVEL sw; AUTO • 75Ω sw; ON • STOP (E-E) mode.	TP17/DM-22 $8.1\text{ V} \pm 0.05\text{ V}$	⚙️ RV9/DM-22

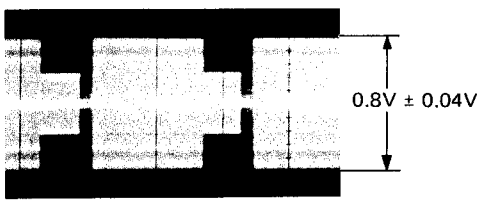
11-4-4. PB A.C.C. Burst Flag Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; NTSC color video signal. • STOP (E-E) mode.	TP15/DM-22: scope CH-A TP5/DM-22: scope CH-B  Pulse Width = $2.8\mu\text{sec} \pm 0.05\mu\text{sec}$	PHASE ADJ ⚙️ RV2/DM-22 WIDTH ADJ ⚙️ RV3/DM-22 TRIG; TP16/DM-22

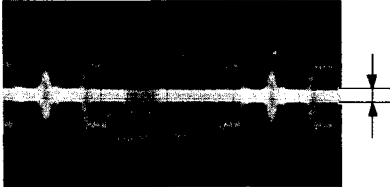
11-4-5. PB A.P.C. Burst Flag Adjustment

machine conditions for adjustment	spec.	adjustment
•VIDEO IN; NTSC color video signal. •STOP (E-E) mode.	TP15/DM-22: scope CH-A TP16/DM-22: scope CH-B  Pulse Width = $2.5\mu\text{sec} \pm 0.05\mu\text{sec}$	width adj. RV5/DM-22 phase adj. RV4/DM-22 TRIG; TP5/DM-22

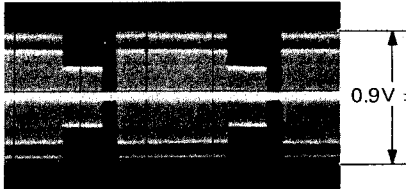
11-4-6. PB A.C.C. Level (Color Killer) Adjustment

machine conditions for adjustment	spec.	adjustment
•VIDEO IN; NTSC color bar signal. •STOP (E-E) mode.	TP20/DM-22  $0.8V \pm 0.04V$	RV10/DM-22 TRIG; TP1/SV-31

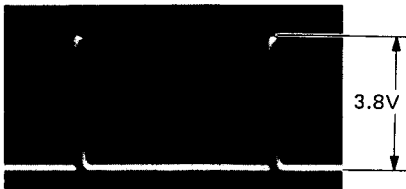
11-4-7. Chroma Converter Balance Adjustment

machine conditions for adjustment	spec.	adjustment
● VIDEO IN; NTSC color bar signal. ● STOP (E-E) mode.	TP15/DM-22  Minimize the amplitude (4.27MHz leak)	⚙️ RV12/DM-22 TRIG; TP8/DM-22

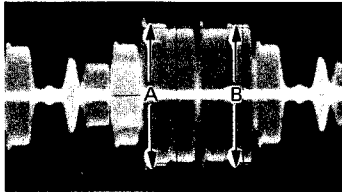
11-4-8. DUB Chroma Output Level Adjustment

machine conditions for adjustment	spec.	adjustment
● VIDEO IN; NTSC color bar signal. ● VIDEO LEVEL sw; AUTO ● 75Ω sw; ON ● STOP (E-E) mode.	TP9/DM-22  $0.9V \pm 0.05V$	⚙️ RV15/DM-22 TRIG; TP1/SV-31

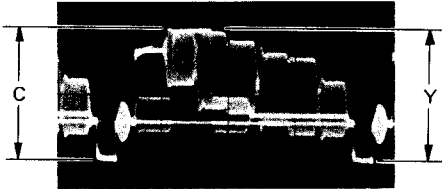
11-4-9. PB A.P.C. Gain Adjustment

machine conditions for adjustment	spec.	adjustment
● Playing back the color bar segment of Alignment Tape. ● Short between Emitter/Q12 and E8 on DM-22 board with jumper lead.	Center pin of RV71/DM-22  $3.8V \pm 0.3V$	⚙️ RV71/DM-22 TRIG;INT

11-4-10. Differential Gain Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; NTSC color bar signal.	TP15/DM-22  A'' Level = B'' Level	⚙️ RV402/DM-22 TRIG; INT

11-4-11. Y/C Mix Level Adjustment

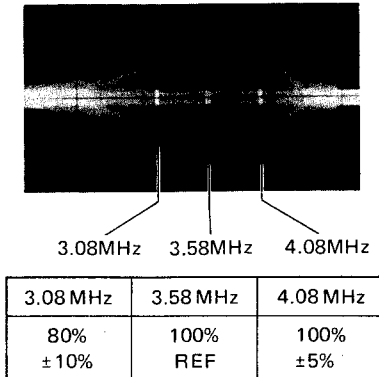
machine conditions for adjustment	spec.	adjustment
• VIDEO IN; NTSC color bar signal. • VIDEO LEVEL sw; AUTO • 75Ω sw; ON • STOP (E-E) mode.	TP10/DM-22  Chroma Level = Y Level (2.0V ± 0.05V)	Chroma Level ⚙️ RV1/DM-22 (Y Level) ⚙️ RV-21/DM-22 TRIG; TP8/DM-22

11-5. CHROMA MODULATOR ADJUSTMENT

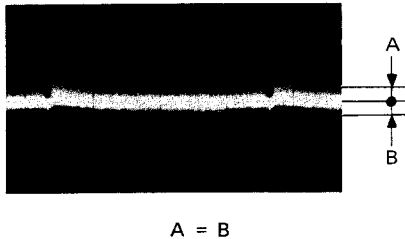
11-5-1. 4.27 MHz Oscillator Frequency Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; NTSC color video signal. • STOP (E-E) mode.	TP20/MP-12 4,267,934Hz ± 5Hz	⚙️ CV1/MP-12 TRIG; INT

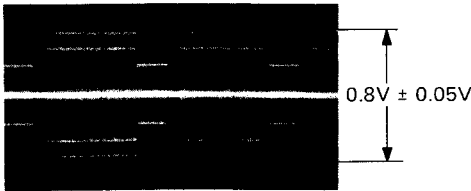
11-5-2. REC Chroma Frequency Response Adjustment

machine conditions for adjustment	spec.	adjustment						
• VIDEO IN; The Gated Sweep signal. • STOP (E-E) mode.	TP2/MP-12  <table border="1"> <tr> <td>3.08 MHz</td><td>3.58 MHz</td><td>4.08 MHz</td></tr> <tr> <td>80% ±10%</td><td>100% REF</td><td>100% ±5%</td></tr> </table>	3.08 MHz	3.58 MHz	4.08 MHz	80% ±10%	100% REF	100% ±5%	⌚ LV3/MP-12 TRIG; TP1/SV-31
3.08 MHz	3.58 MHz	4.08 MHz						
80% ±10%	100% REF	100% ±5%						

11-5-3. REC A.P.C. Burst Tuning Adjustment

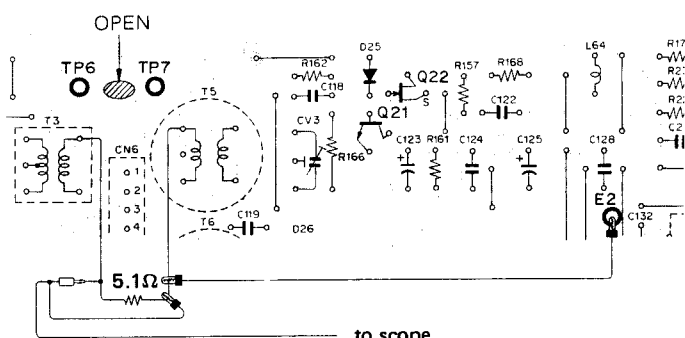
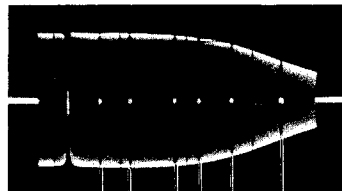
machine conditions for adjustment	spec.	adjustment
• VIDEO IN; NTSC color video signal. • STOP (E-E) mode.	TP18/MP-12  A = B	⌚ T1/MP-12 TRIG; TP1/SV-31

11-5-4. REC A.C.C. Level Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; NTSC color video signal. • STOP (E-E) mode.	TP2/MP-12  0.8V ± 0.05V	⌚ RV1/MP-12 TRIG; TP1/SV-31

11-6. RECORD AMPLIFIER ADJUSTMENT

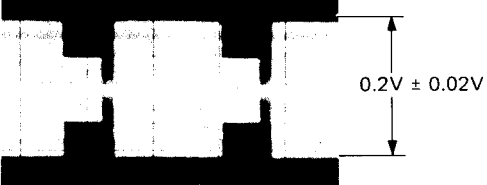
11-6-1. Y-REC Current Frequency Response Adjustment

machine conditions & spec. for adjustment	adjustment										
•VIDEO IN; Monoscope signal •Record mode •Turn RV6, RV8/MP-12 board ↺ fully counterclockwise •Connect temporarily 5.1Ω Resistor between TP6 (TP8) and TP7 (TP9) on MP-12 board. () CH-B •Short between TP7 (TP9) and E2 on MP-12 board. () CH-B •Unsolder temporarily between TP6 (TP8) and TP7 (TP9) on MP-12 board. () CH-B •Connect Sweep Signal Generator between TP4 and E11 on MP-12 board	CH-A Adj. RV7/MP-12 CH-B Adj. RV11/MP-12										
 waveform of between TP6(TP8) and TP7(TP9)  <table><tr><th>1.0 MHz</th><th>2.0 MHz</th><th>3.58 MHz</th><th>4.5 MHz</th><th>8.0 MHz</th></tr><tr><td>100% REF</td><td>100% +0 -5%</td><td>90% ±5%</td><td>85% ±5%</td><td>56% ±5%</td></tr></table>	1.0 MHz	2.0 MHz	3.58 MHz	4.5 MHz	8.0 MHz	100% REF	100% +0 -5%	90% ±5%	85% ±5%	56% ±5%	TRIG; TP1/SV-31
1.0 MHz	2.0 MHz	3.58 MHz	4.5 MHz	8.0 MHz							
100% REF	100% +0 -5%	90% ±5%	85% ±5%	56% ±5%							

11-6-2. Y REC Current Level Adjustment

machine conditions for adjustment & spec.	adjustment
• VIDEO IN; NTSC color bar signal. • Record mode. • Connect temporarily 5.1Ω Resistor between TP6 (TP8) and TP7 (TP9) on MP-12 board. () CH-B • Short between TP7 (TP9) and E2 on MP-12 board. () CH-B • Unsolder temporarily between TP6 (TP8) and TP7 (TP9) on MP12 board. () CH-B waveform of between TP6(TP8) and TP7(TP9)	TRIG; TP1/SV-31

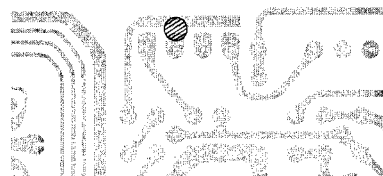
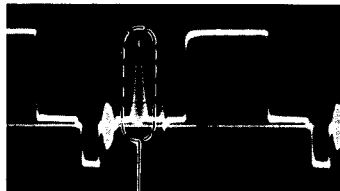
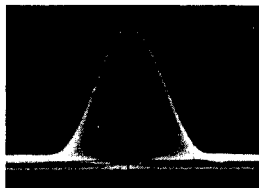
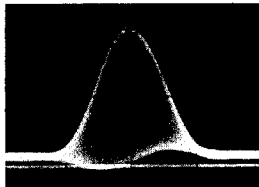
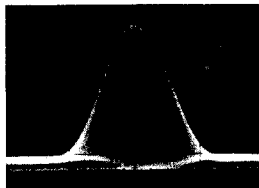
11-6-3. Chroma-REC Current Level Adjustment

machine conditions for adjustment	spec.	adjustment
● VIDEO IN; NTSC color bar signal. ● VIDEO LEVEL sw; AUTO ● 75Ω sw; ON ● Self-Record and then Playback mode.	TP14/DM-22 Playback level of the Self-Recorded tape 	⚙️ RV8/MP-12 (Perform adjustment during RECORD mode) Repeat the sequence of adj. → record → playback (level check) until required specification is met. TRIG; TP1/SV-31

11-7. Y/CHROMA DELAY TIME ADJUSTMENT

This adjustment is usually not necessary since Y/Chroma delay time variation among multiple recorders and players is negligibly small.

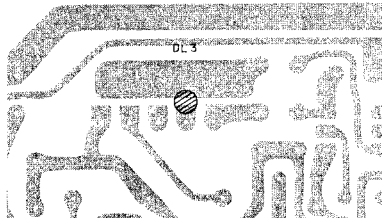
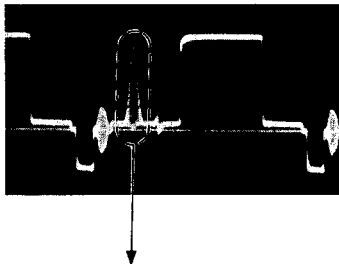
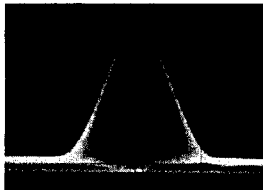
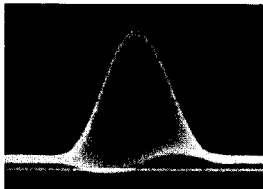
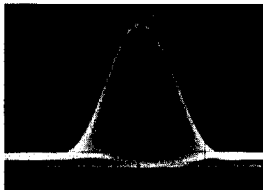
11-7-1. PB Y/Chroma Delay Time Adjustment

machine conditions for adjustment	spec.	adjustment
•Playing back the Sin² wave segment of Alignment Tape.	DL 2  TP10/DM-22  GOOD  NG  NG 	DL2/DM-22 TRIG; TP8/DM-22

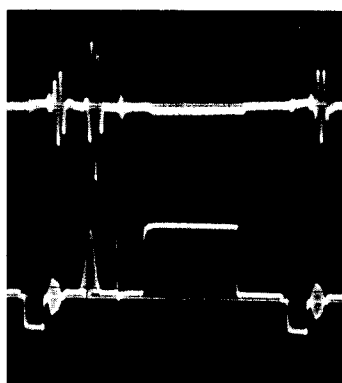
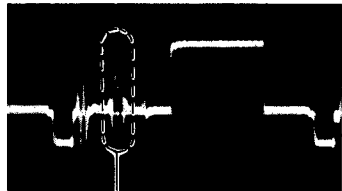
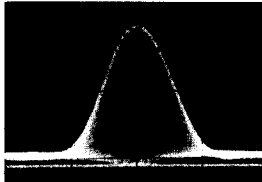
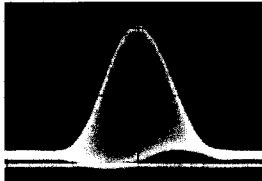
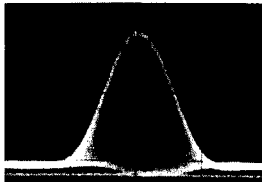
DL2/DM-22

TRIG; TP8/DM-22

11-7-2. REC Y/Chroma Delay Time Adjustment

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; Sin² wave signal. • Playing back the Self-Recorded Tape.	 TP10/DM-22  GOOD  NG  NG 	DL3/MP-12 TRIG; TP8/DM-22

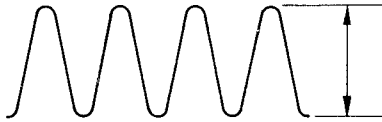
11-7-3. DUB Y/Chroma Delay Time Adjustment

machine conditions for adjustment	spec.	adjustment
• Playing back the Sin^2 wave segment of Alignment Tape.  DL4	TP9/DM-22  TP11/DM-22 ADD mode  ① Y and Chroma signals are in phase.  ② Chroma signal is advanced.  ③ Chroma signal is delayed. 	DL4/DM-22 1) Select the suitable tap according to short any taps of DL4/DM-22 board so that the waveform meets the photo ①. 2) Solder the printed foil pattern so that the chroma delay time is delayed 0.1 μsec. • Each one tap is 0.1 μsec delayed. • The photo ③ shows that the chroma signal is delayed from the photo ①.

SECTION 12

EDITING SYSTEM ALIGNMENT

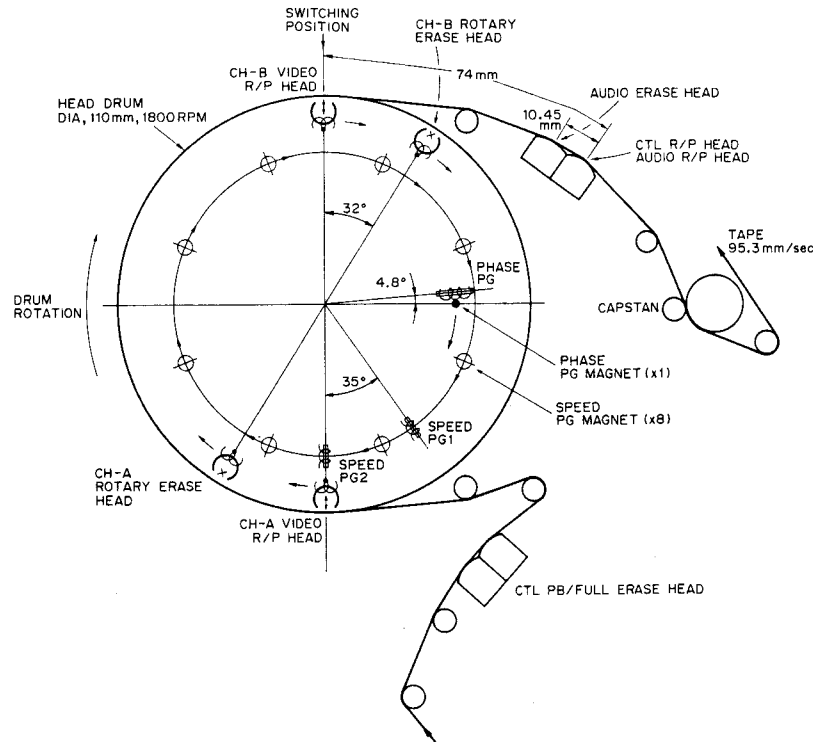
12-1. ROTARY ERASE CURRENT ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; NTSC color bar signal. • VIDEO INSERT mode. • EDIT mode.	TP2/RE-5 (CH-A) TP1/RE-5 (CH-B)  CH-A Level = CH-B Level $\approx 200\text{mV} \pm 5\text{mV}$	- RV2/RE-5 (CH-A) - RV1/RE-5 (CH-B) TRIG; INT

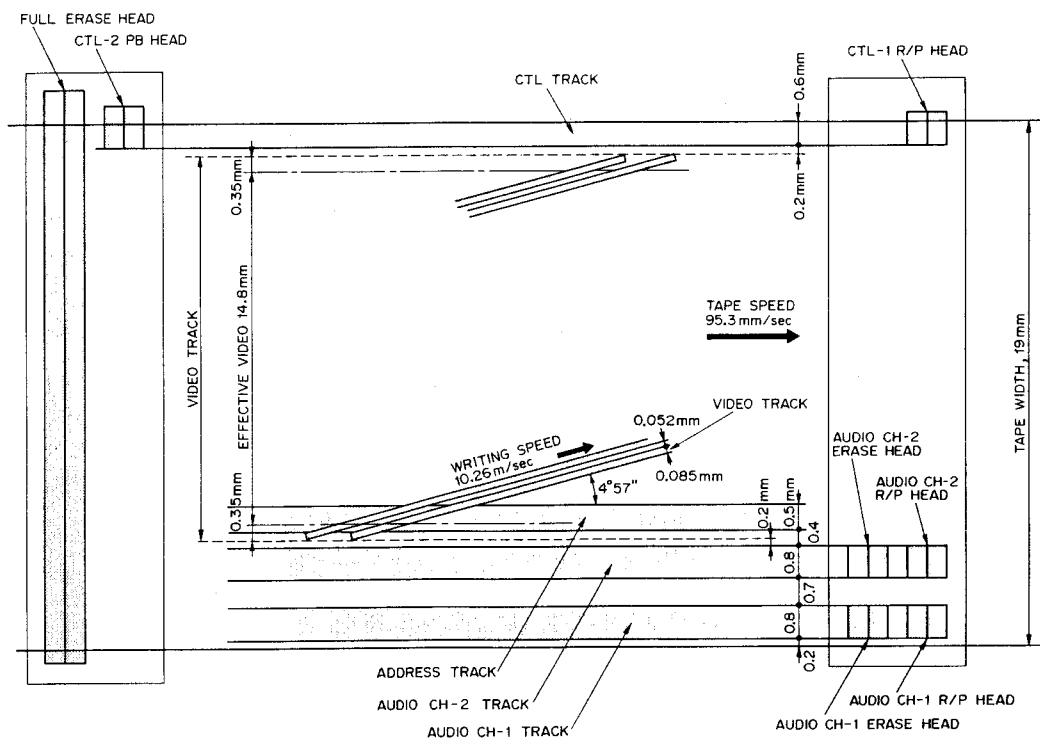
SECTION 13

BLOCK DIAGRAMS AND TIMING CHARTS

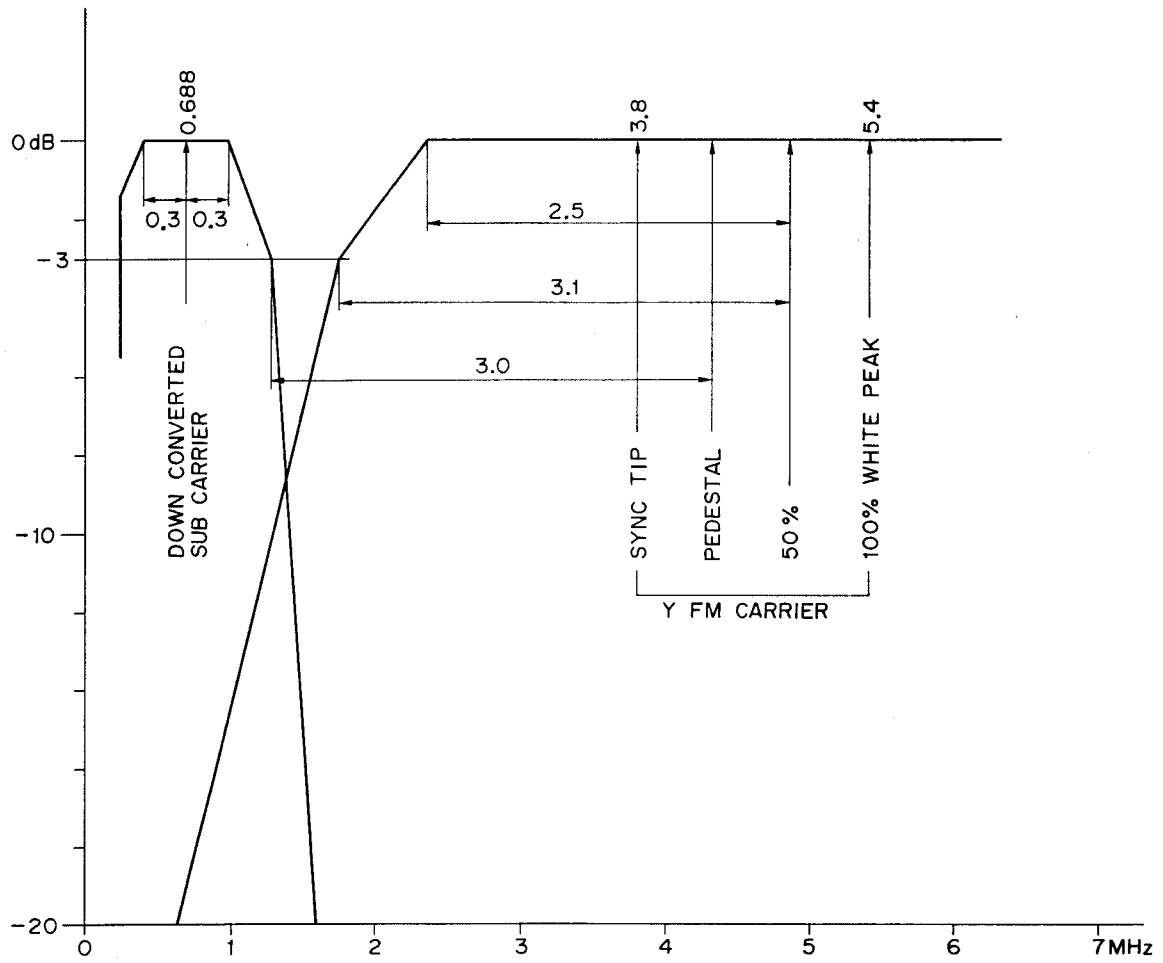
HEAD LOCATION



TAPE PATTERN



FREQUENCY ALLOCATION



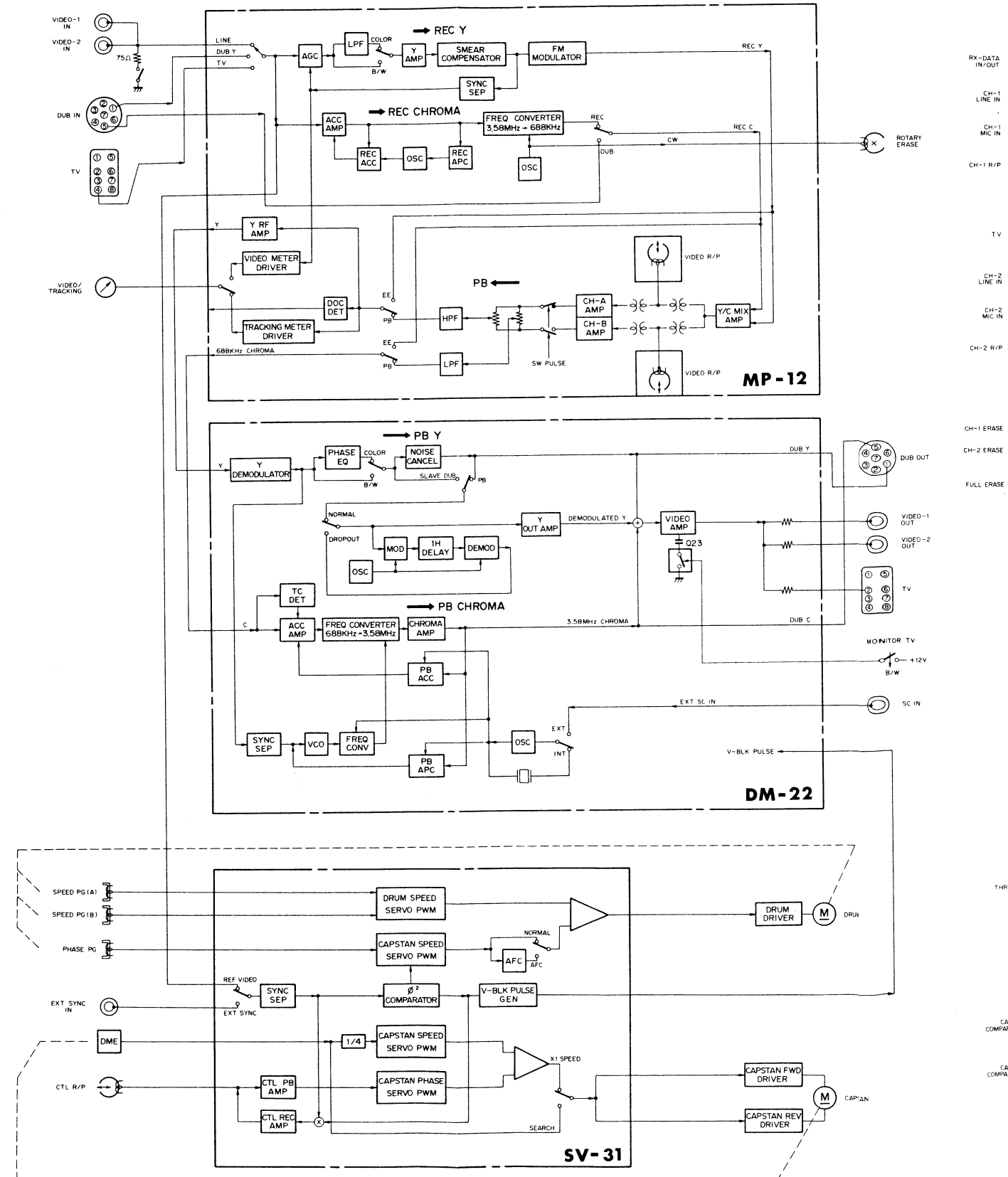
CIRCUIT FUNCTION OVERALL

CIRCUIT FUNCTION OF THE PRINTED CIRCUIT BOARD

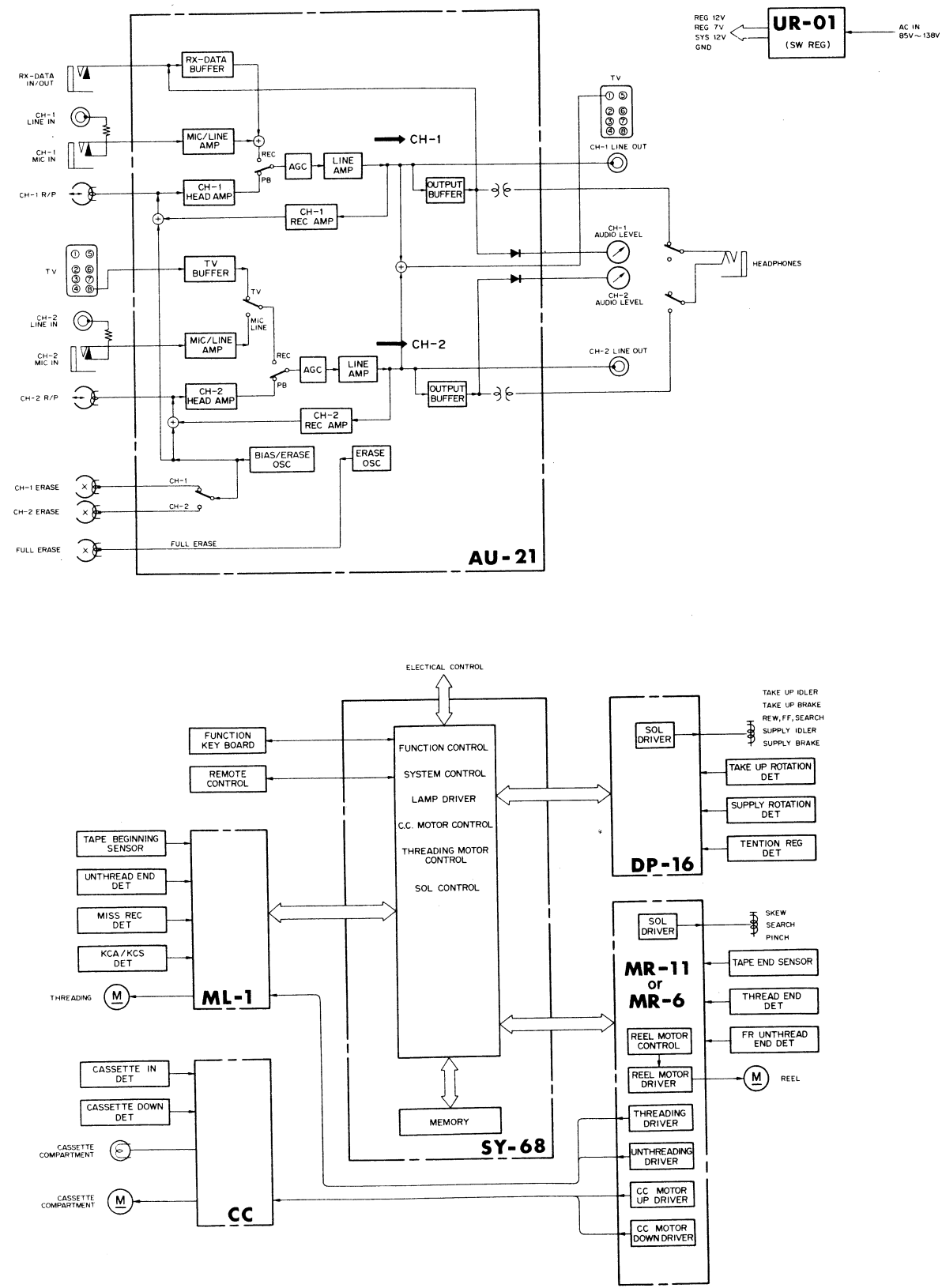
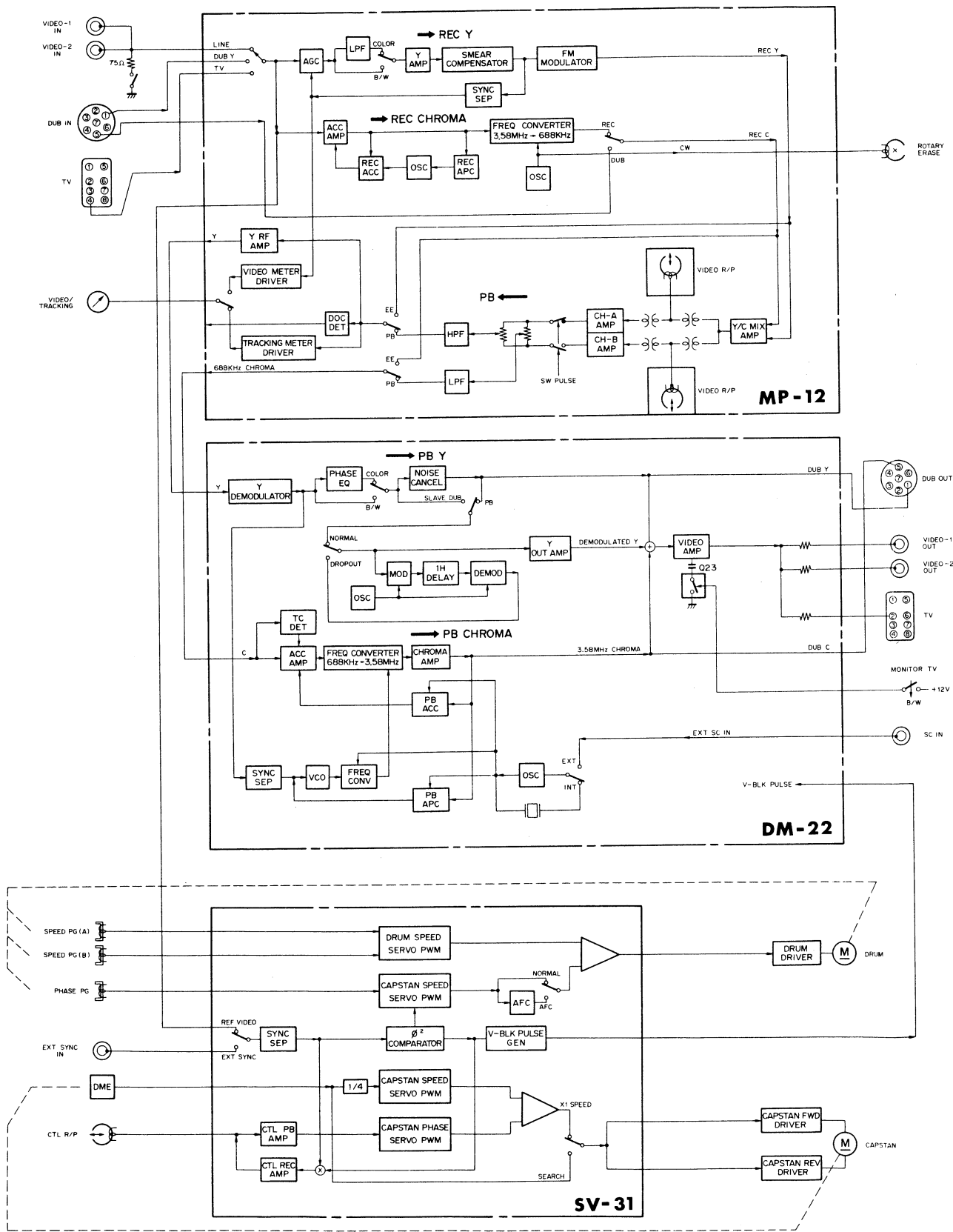
The Circuit Board Information is Provided Below

SYSTEM	BOARD	CIRCUIT FUNCTION
VIDEO	MP-12	- Luminance and Chrominance Signal Modulator - REC/PB Amplifier
	CB-6	Video Input Connector Board
	DM-22	Luminance and Chrominance Signal Demodulator
	DL-2	1H Delay
AUDIO	AU-21	- Audio REC/PB Amplifier - Bias/Erase Oscillator
	MI-3	CH-1/CH-2 Mic Input
	HP-3	Headphones Level Control/Headphones Jack
	EC-19	Full Erase /CTL PB Head
	AH-3	Audio REC/PB/Erase and CTL REC/PB Head
	MC-17	Audio/Tracking Meter and Level Control
EDIT	RE-5	Rotary Erase
	BS-3	Blanking Switcher
SERVO	SV-31	- Drum/Capstan Speed and Phase PWM Servo - CTL REC/PB Amplifier
	MR-6 (RS-6)	Threading/Cassette Compartment Motor Driver
	MR-11	- Skew/Search/Pinch Solenoid Driver - Reel Motor Control and Driver
	PT-9 (A)	Drum Motor Power Driver
	DC-10	- Drum/Capstan Motor Driver - DME Shaper
	PT-9 (B)	Reel Motor Power Driver
POWER SUPPLY	AC-26	AC Input
	UR-01	Switching Regulator
	DC-10	Power Supply
SYSTEM CONTROL	FR-11	Threading Ling Mechanical Position Detector
	PH-4	Tenreg Detector
	PH-5	Tape End Sensor/Tape Beginning Sensor
	KY-13	- Function Key Board - Display Driver - Mode/Input/Monitor Select
	DP-10	Display
	PD-16	Take up Idler/Brake and Supply Idler/Brake REW FF Search Solenoid Driver
	SW-43	- Take up Reel Rotation Detector - Supply Reel Rotation Detector
	ML-1	Hours Meter
	LM-7	Threading Motor
	SW-46	- Miss REC Detector - KCA/KCS Detector
	SW-50	Unthread End Detector
	CC-9	Cassette Compartment Motor/PL
	CC-10	Cassette in Detector
	CC-11	Cassette Down Detector
	SY-68	System Control Micro Processor
	PT-9 (C)	Regulator for System Control

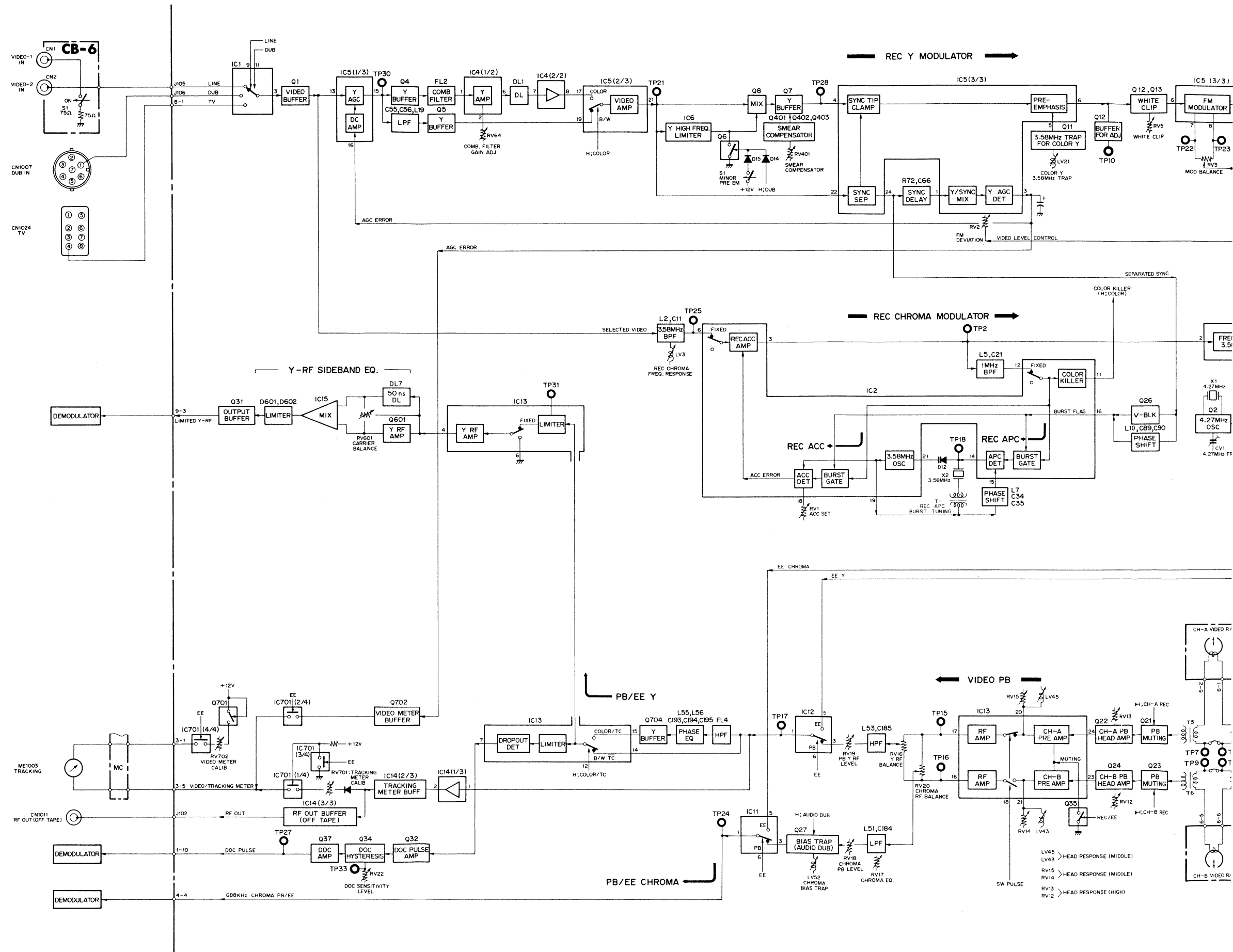
OVERALL BLOCK DIAGRAM



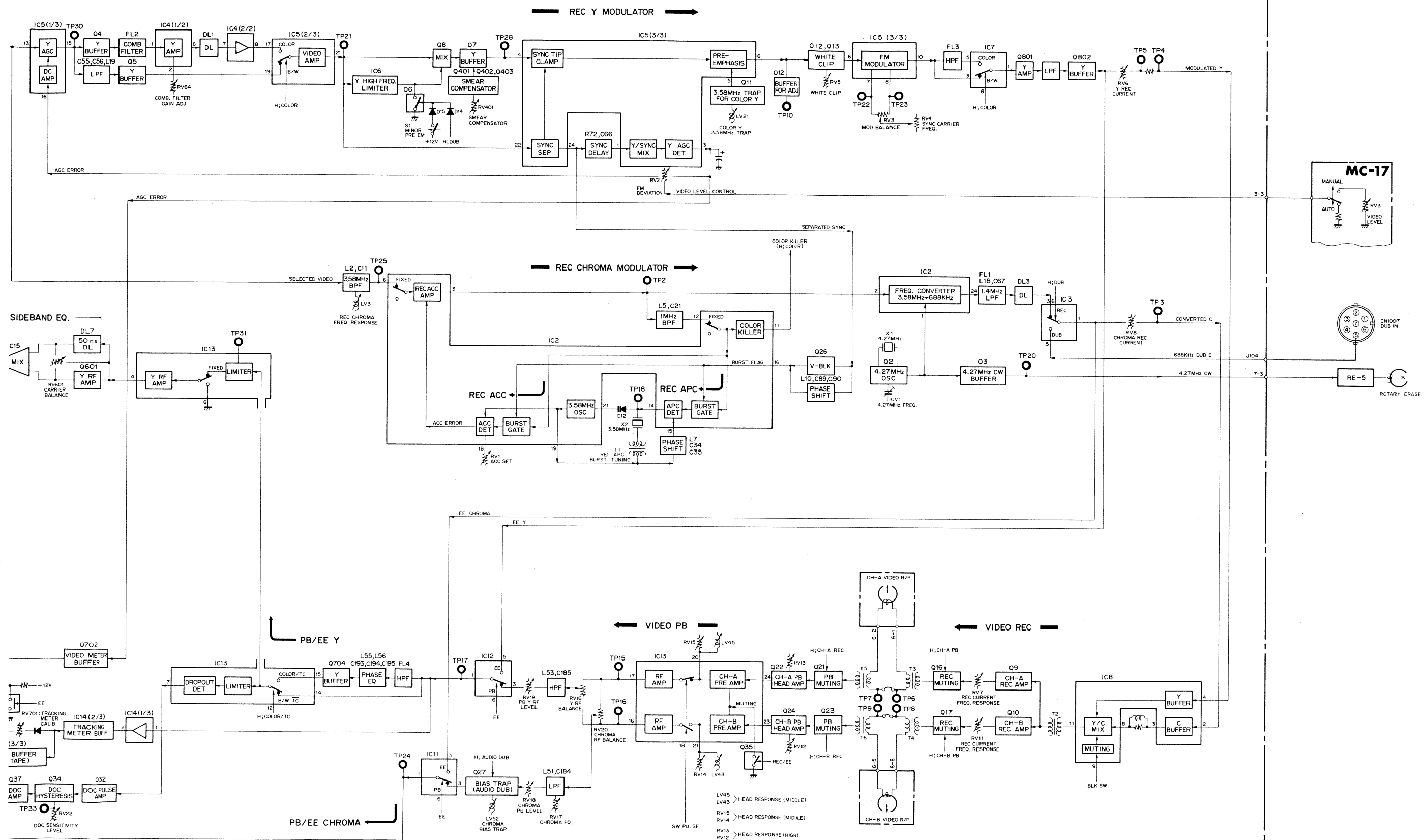
OVERALL BLOCK DIAGRAM



VIDEO MODULATOR BLOCK DIAGRAM



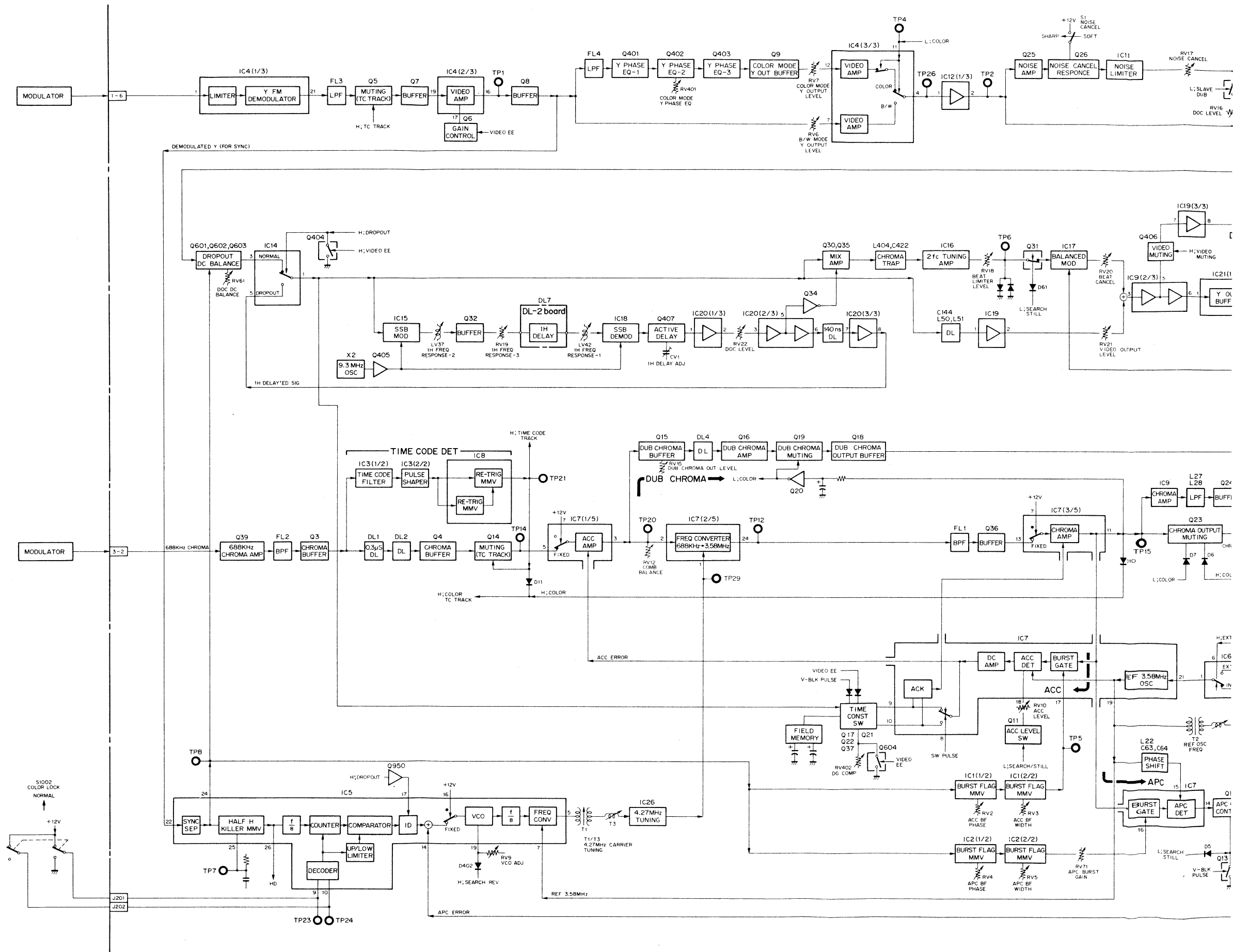
VIDEO

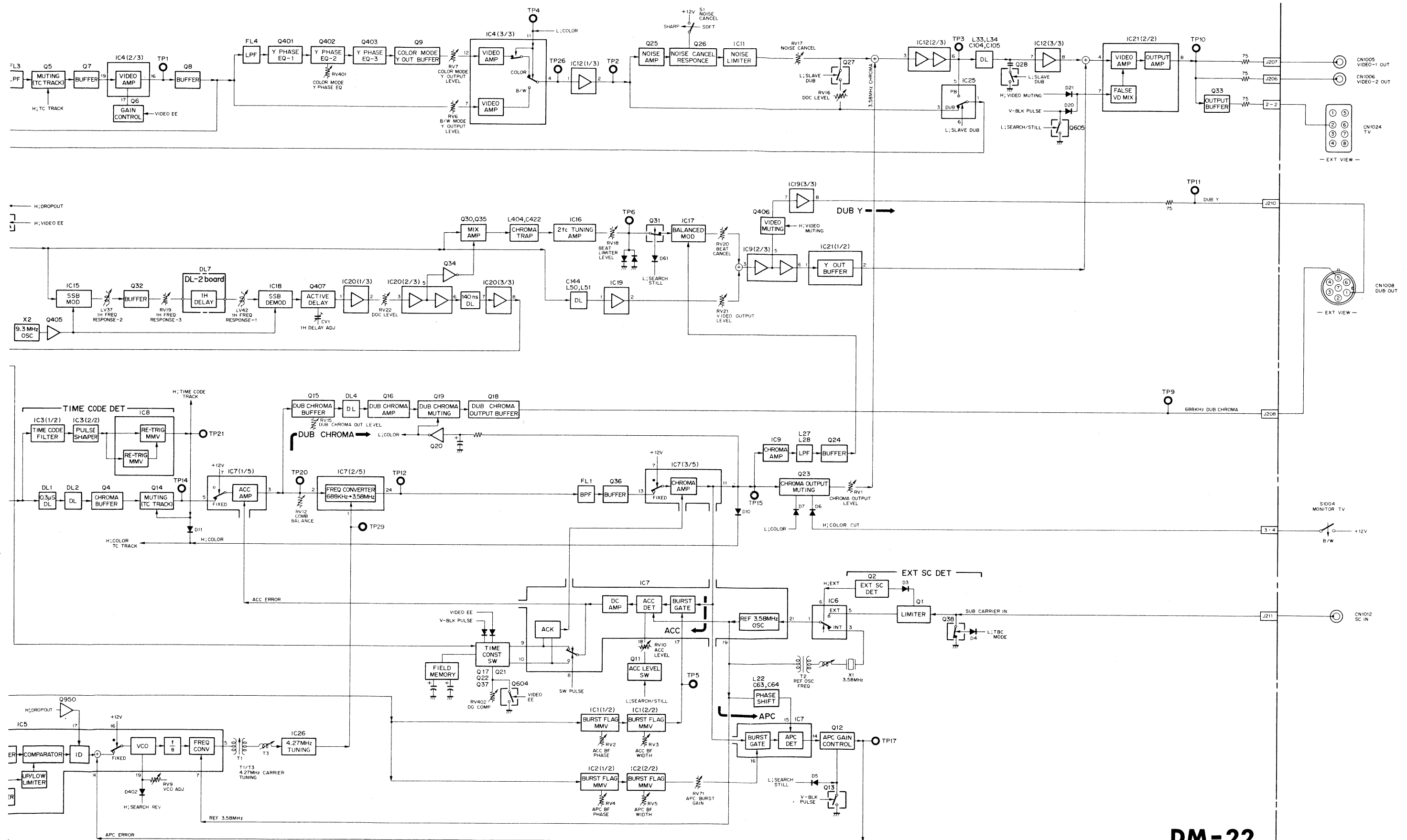


MP-12

VIDEO VIDEO

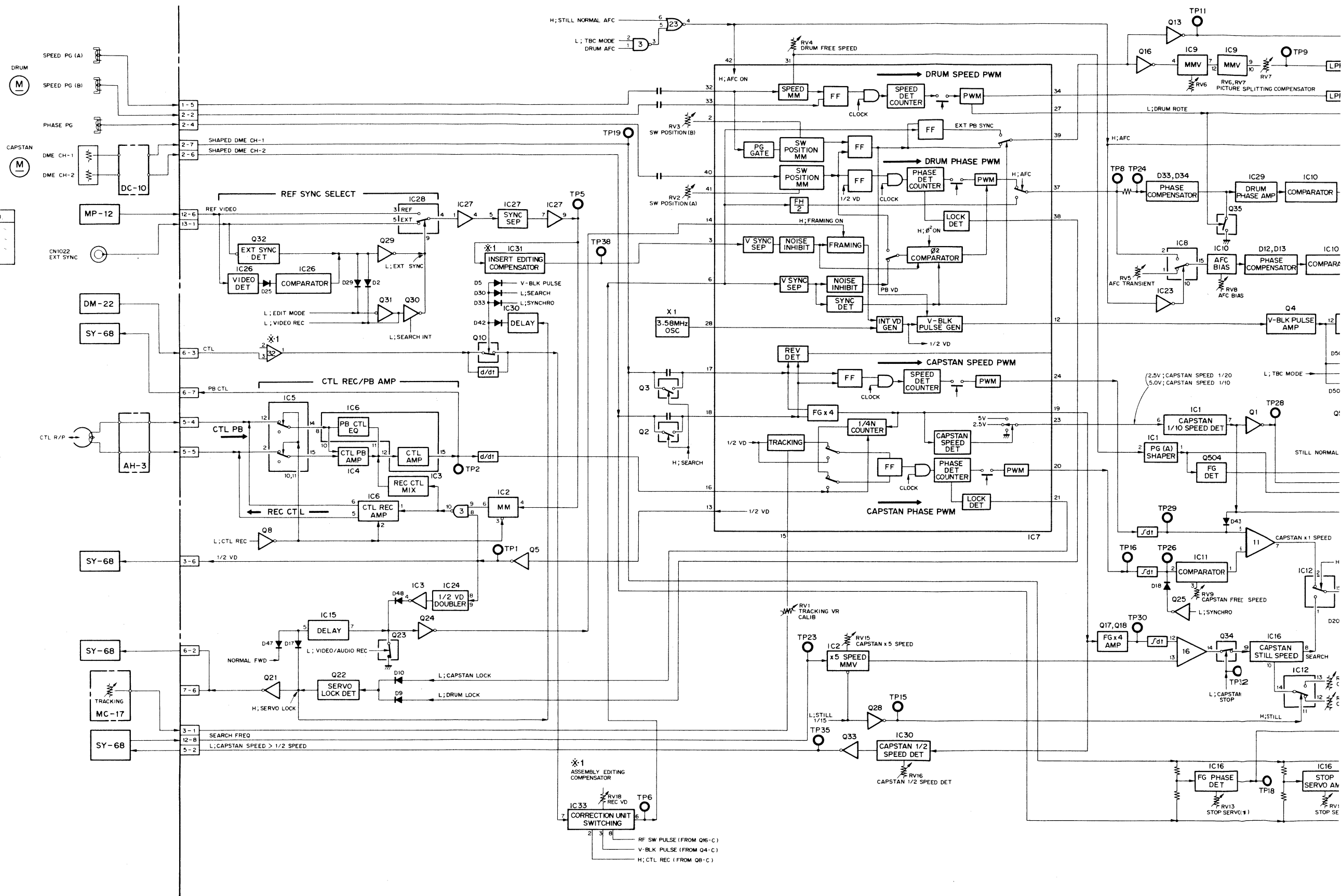
VIDEO DEMODULATOR BLOCK DIAGRAM



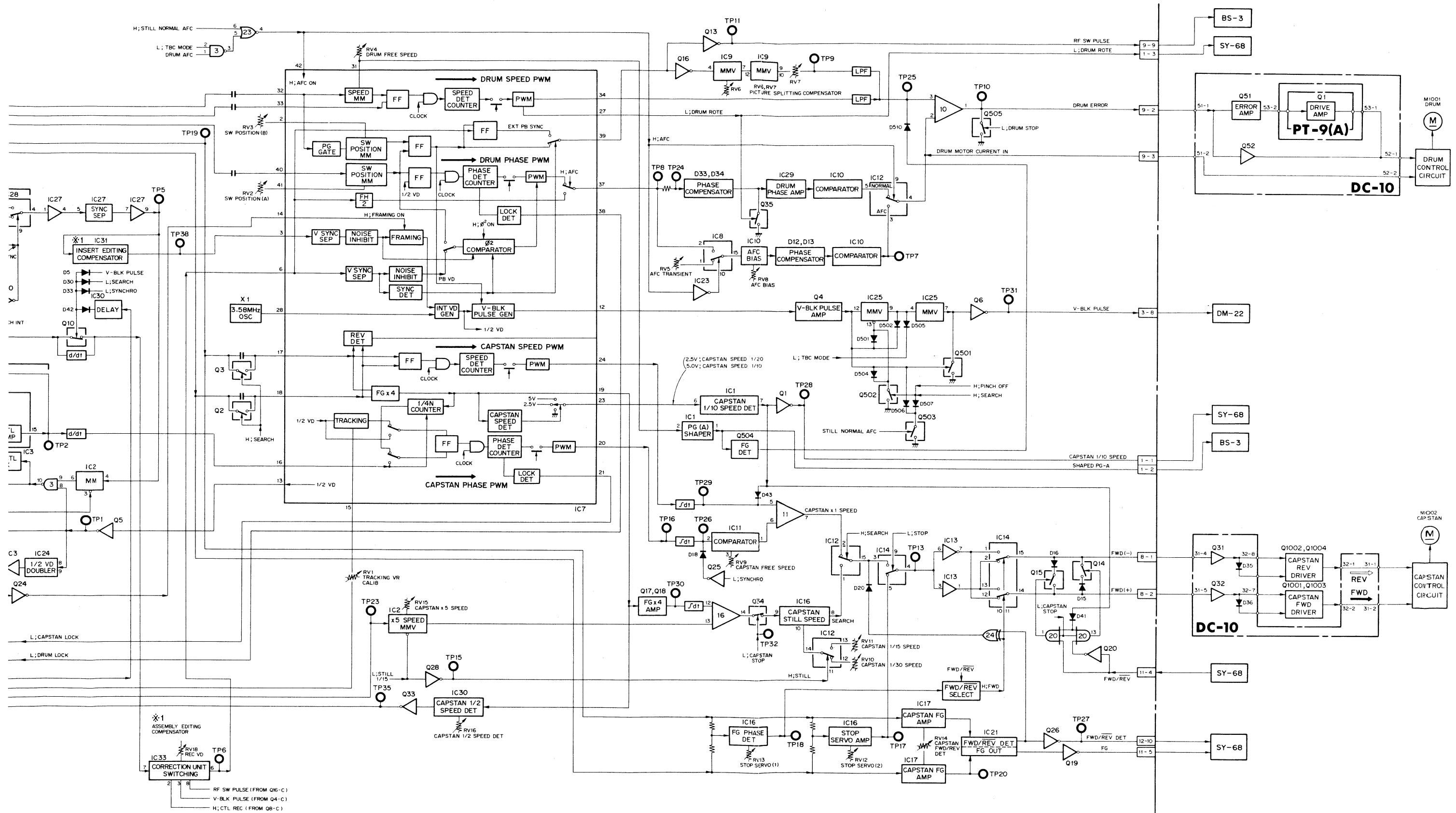


SERVO SYSTEM BLOCK DIAGRAM

MARK	CHANGE INFORMATION	SERIAL NO.
✕ 1	IC31 ADDED IC32 ADDED IC33 ADDED RV18 ADDED	USA 18911 ~ CND 20661 ~ J 11501 ~



SERVO SERVO

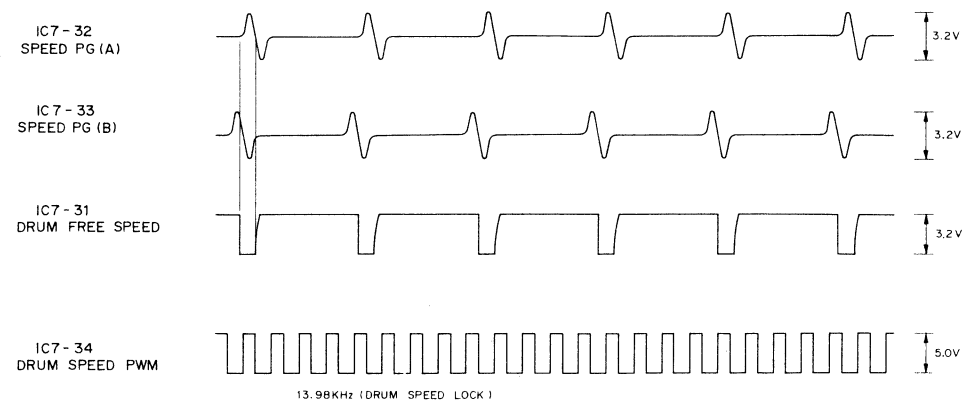


SV-31

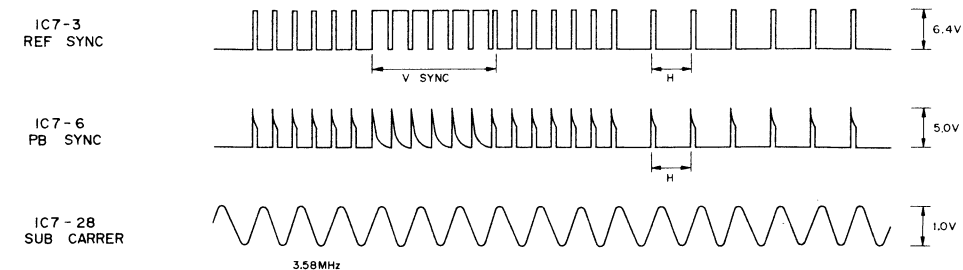
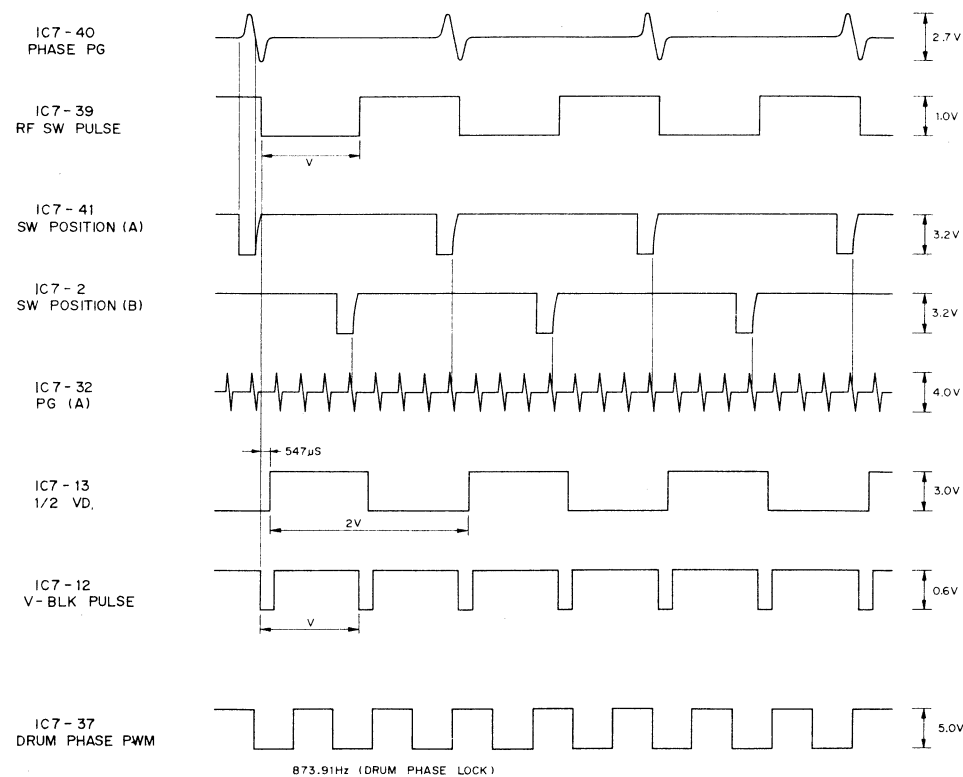
TIMING CHART

SERVO TIMING CHART

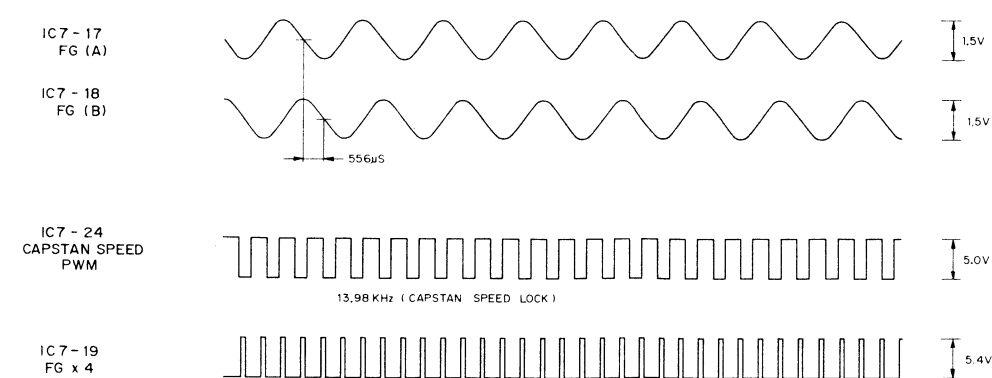
DRUM SPEED PWM SERVO



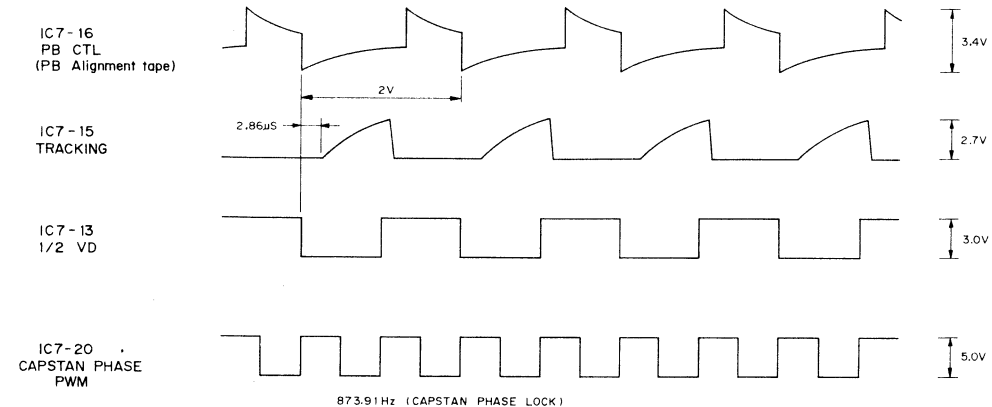
DRUM PHASE PWM SERVO



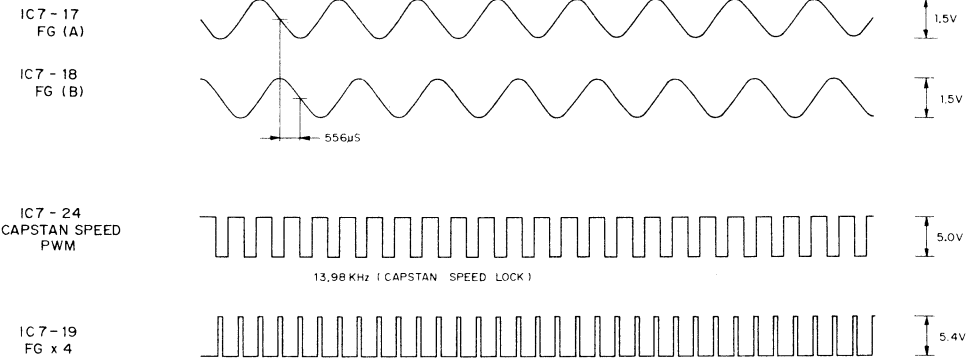
CAPSTAN SPEED PWM SERVO



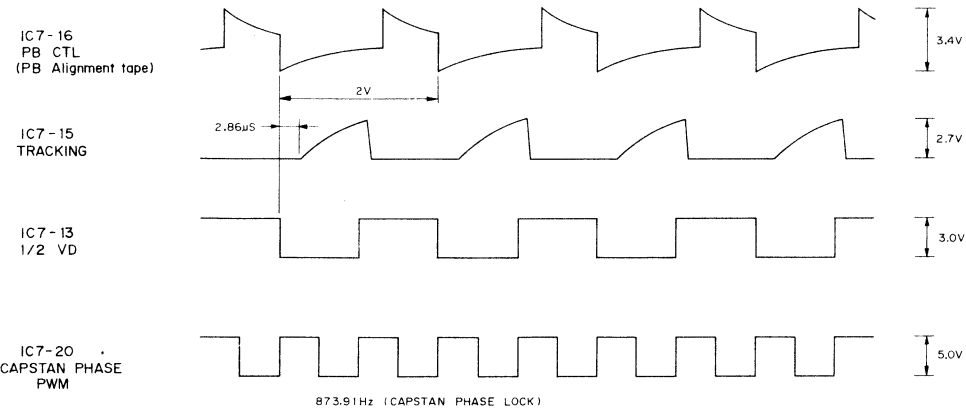
CAPSTAN PHASE PWM SERVO



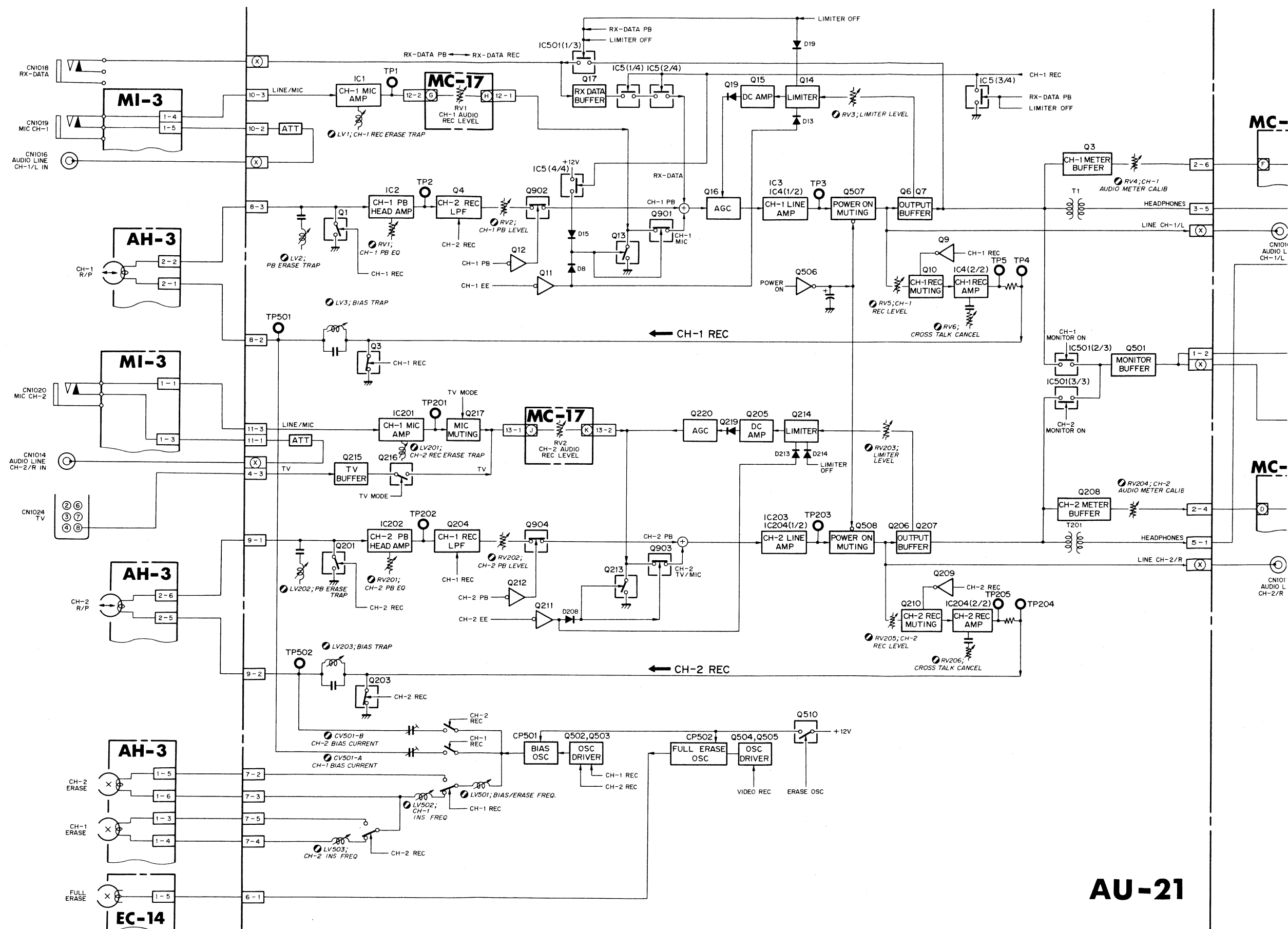
CAPSTAN SPEED PWM SERVO



CAPSTAN PHASE PWM SERVO



AUDIO BLOCK DIAGRAM

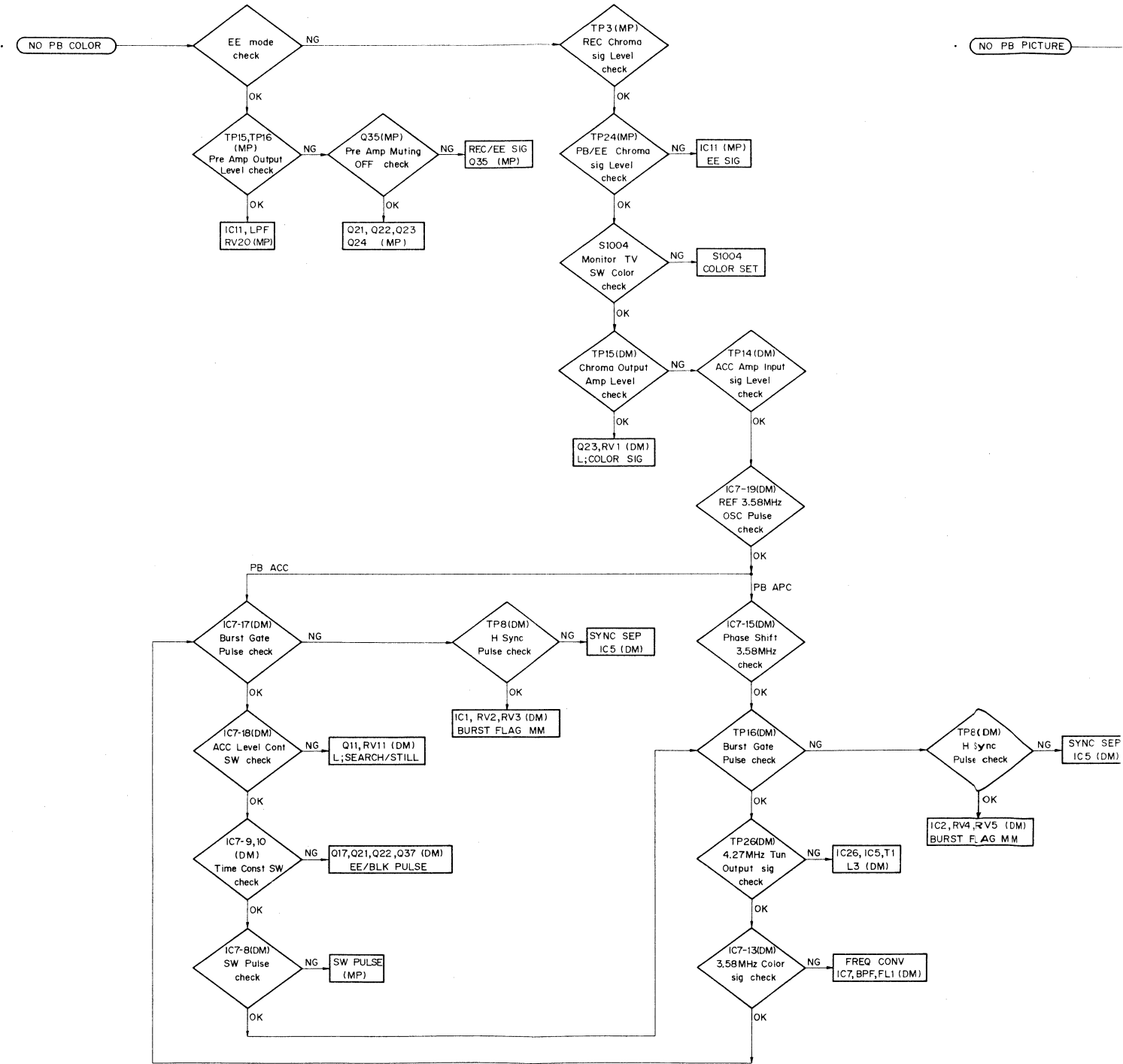
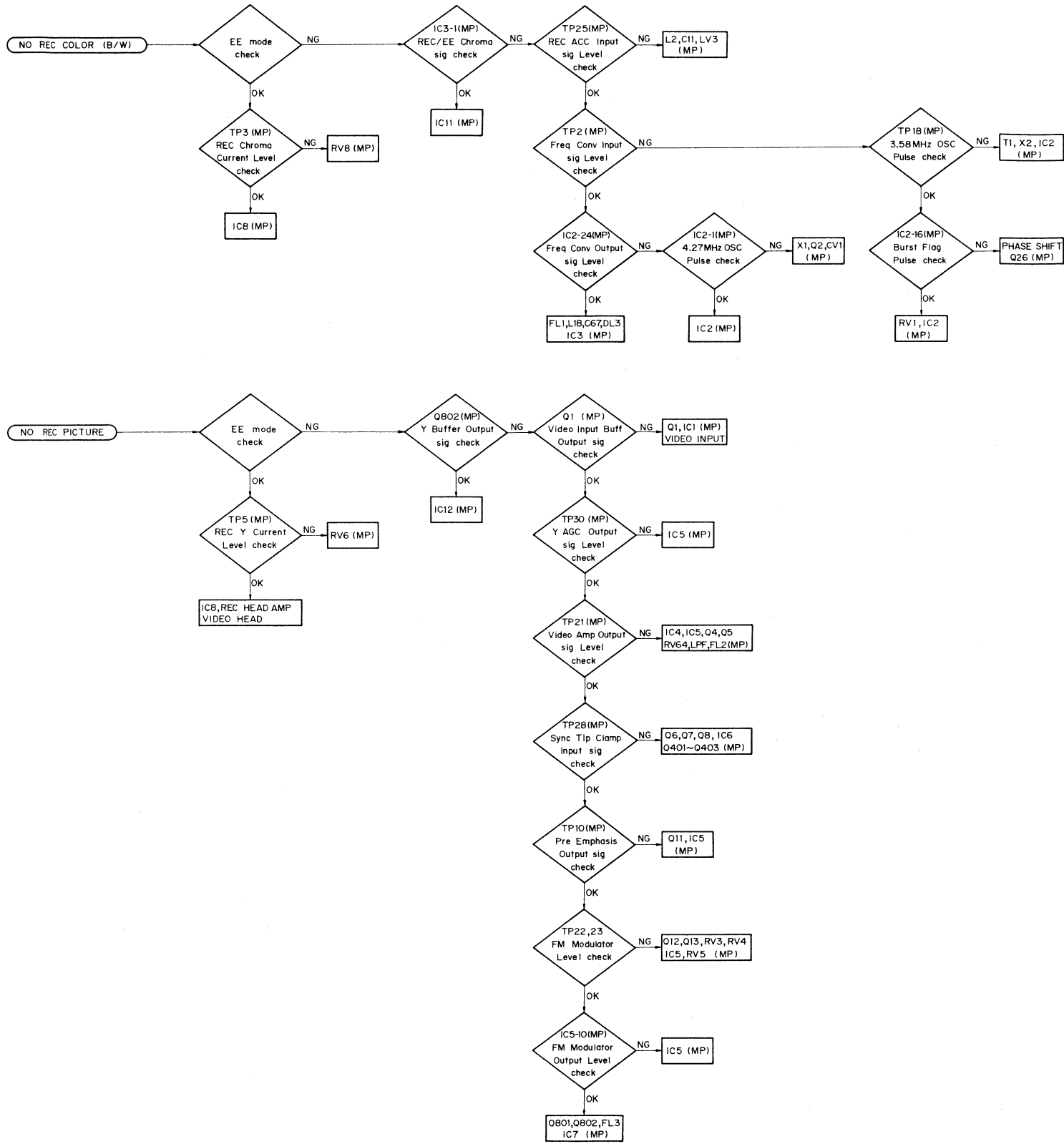


AUDIO AUDIO

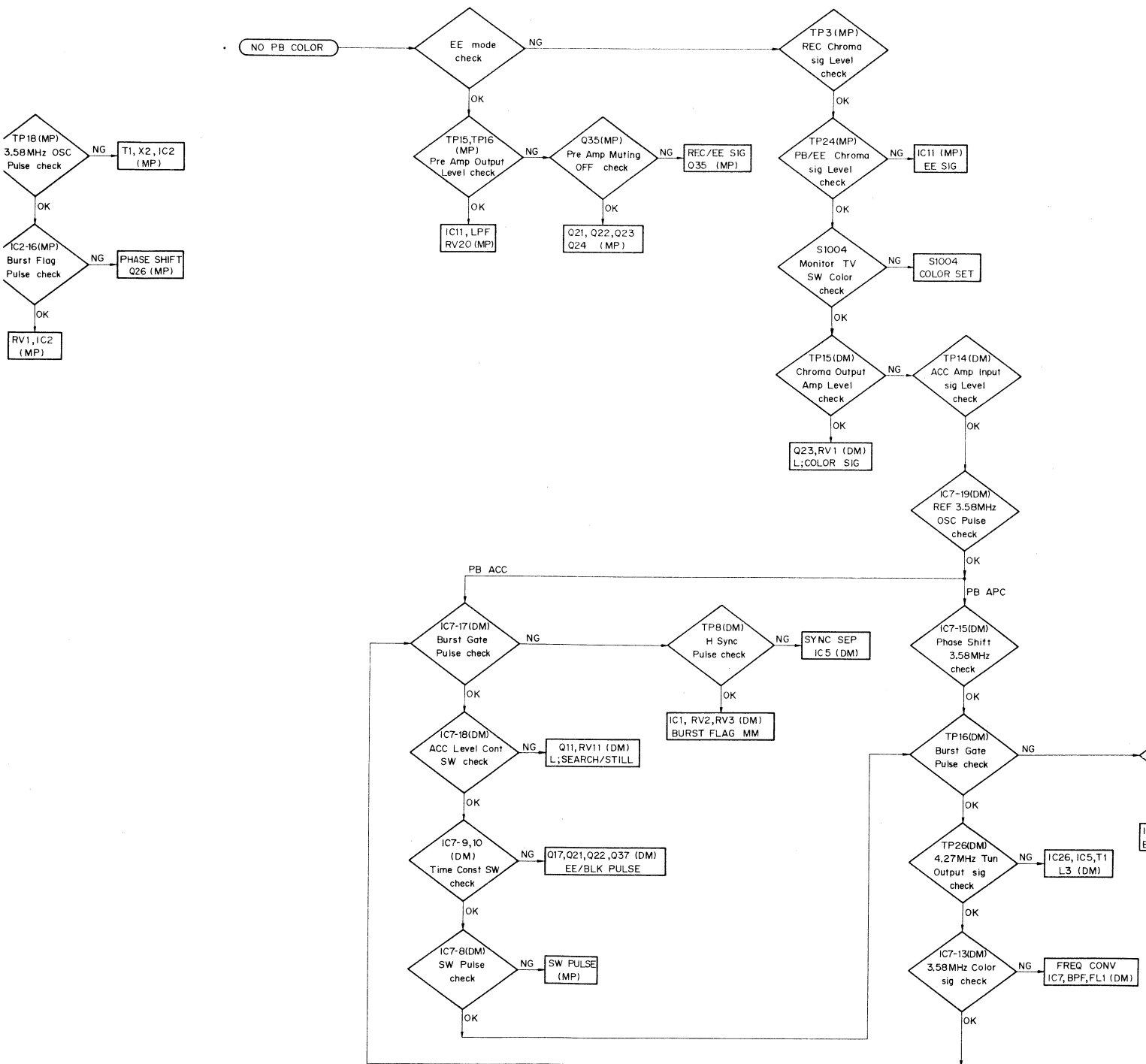


VIDEO SYSTEM FLOW CHART

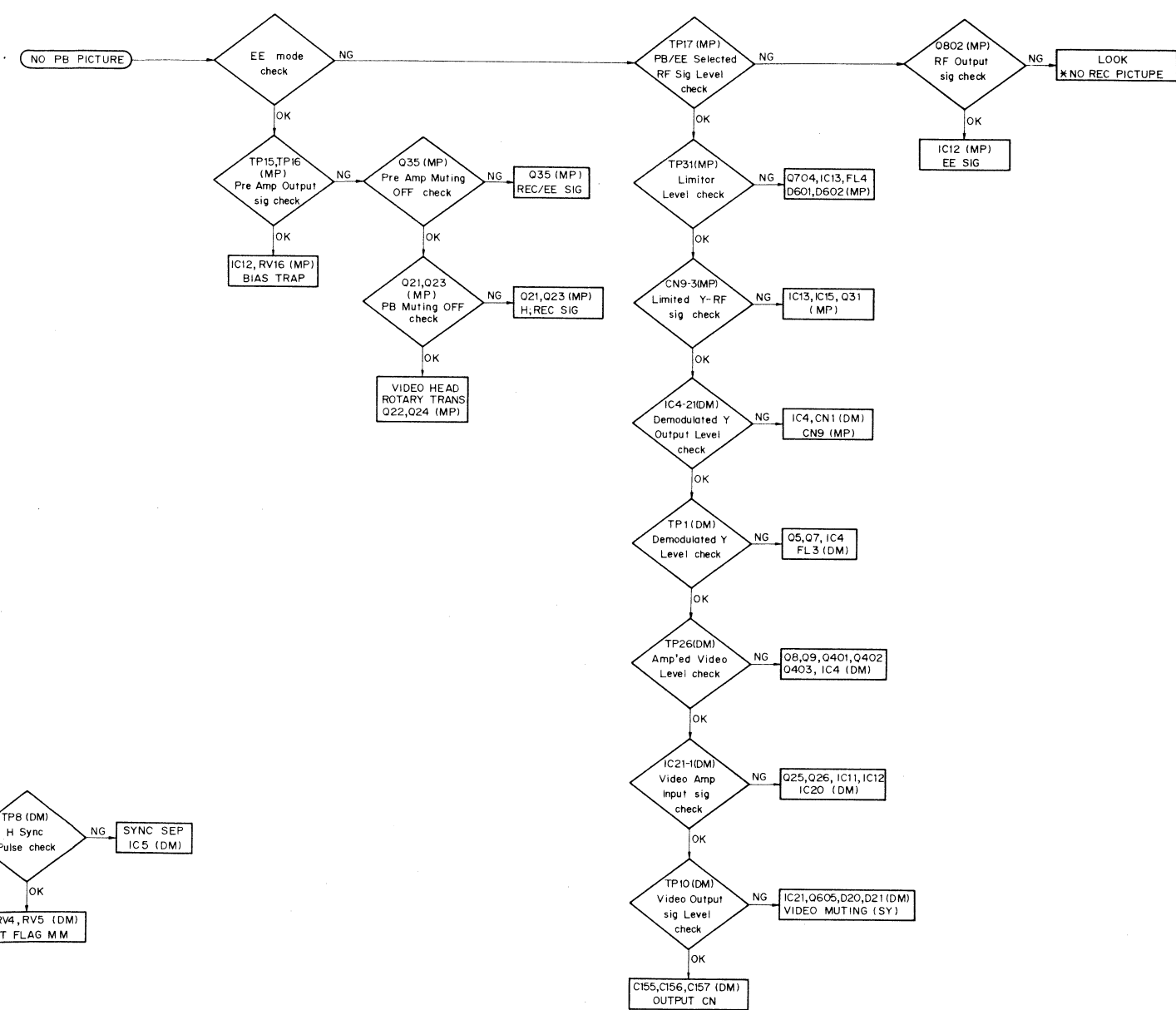
CONDITION: Clean the VIDEO Head, Locked Servo



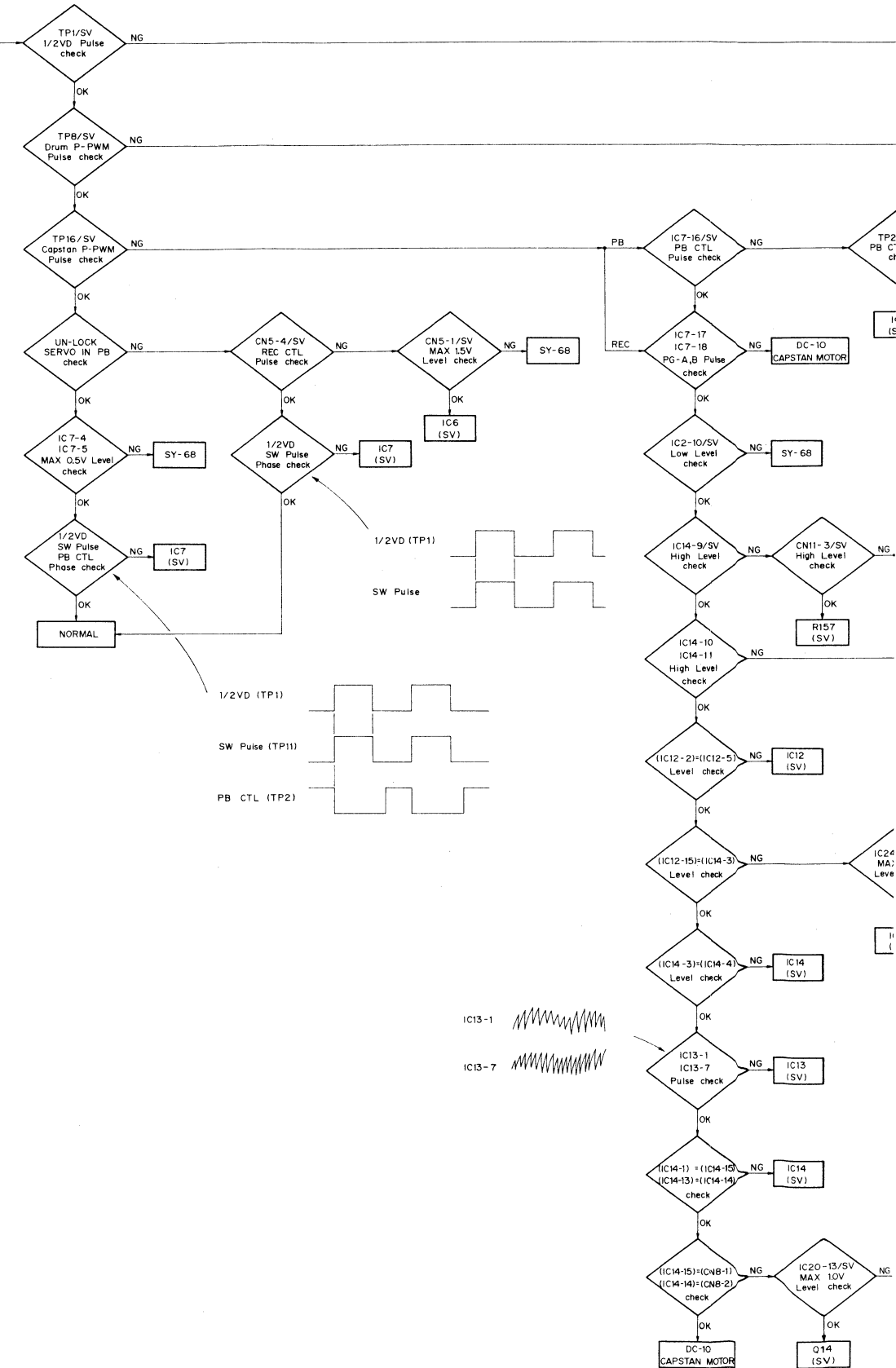
HART FLOW CHART



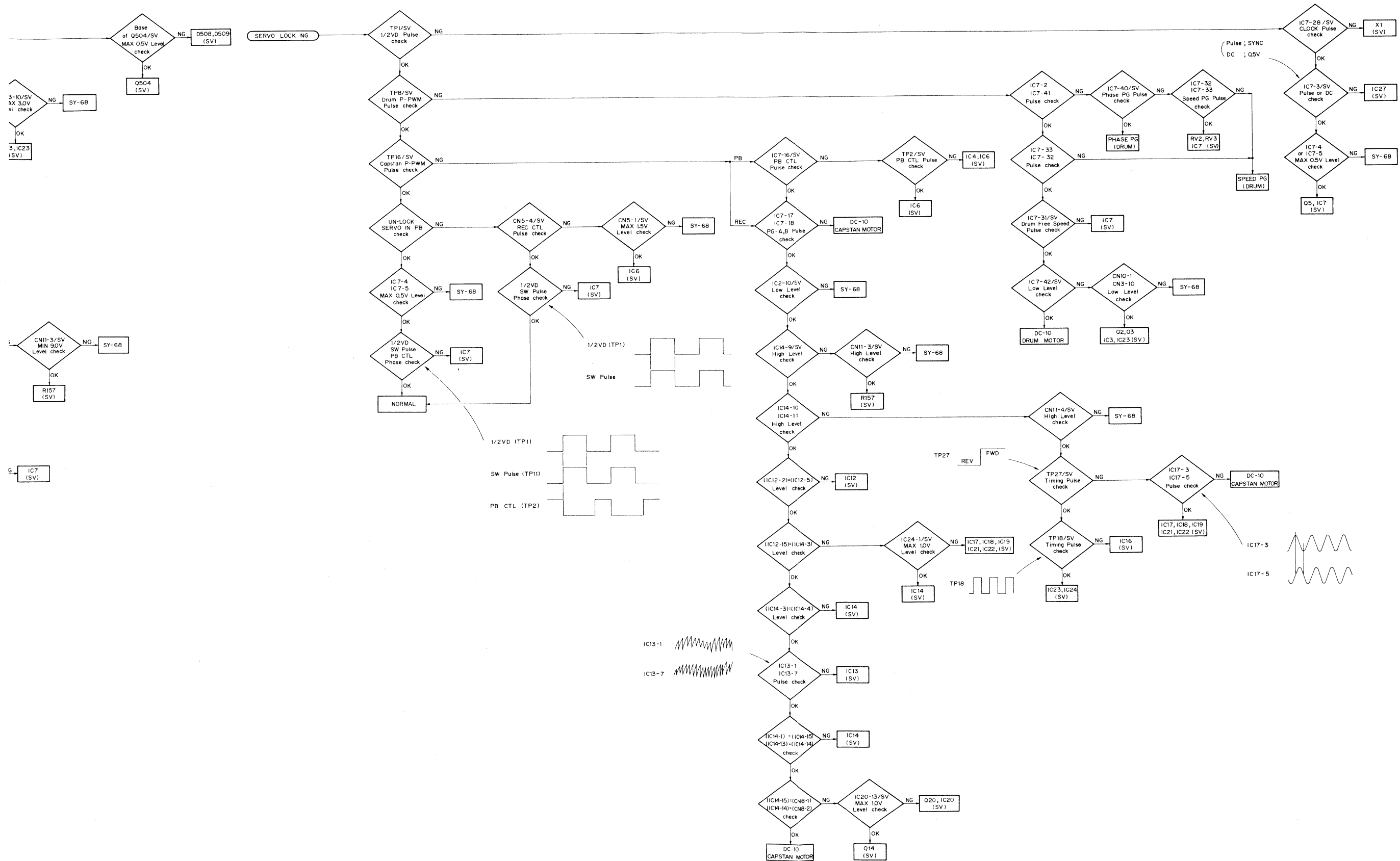
FLOW CHART



CONDITION; Clean the CTL Head. Normal Video System



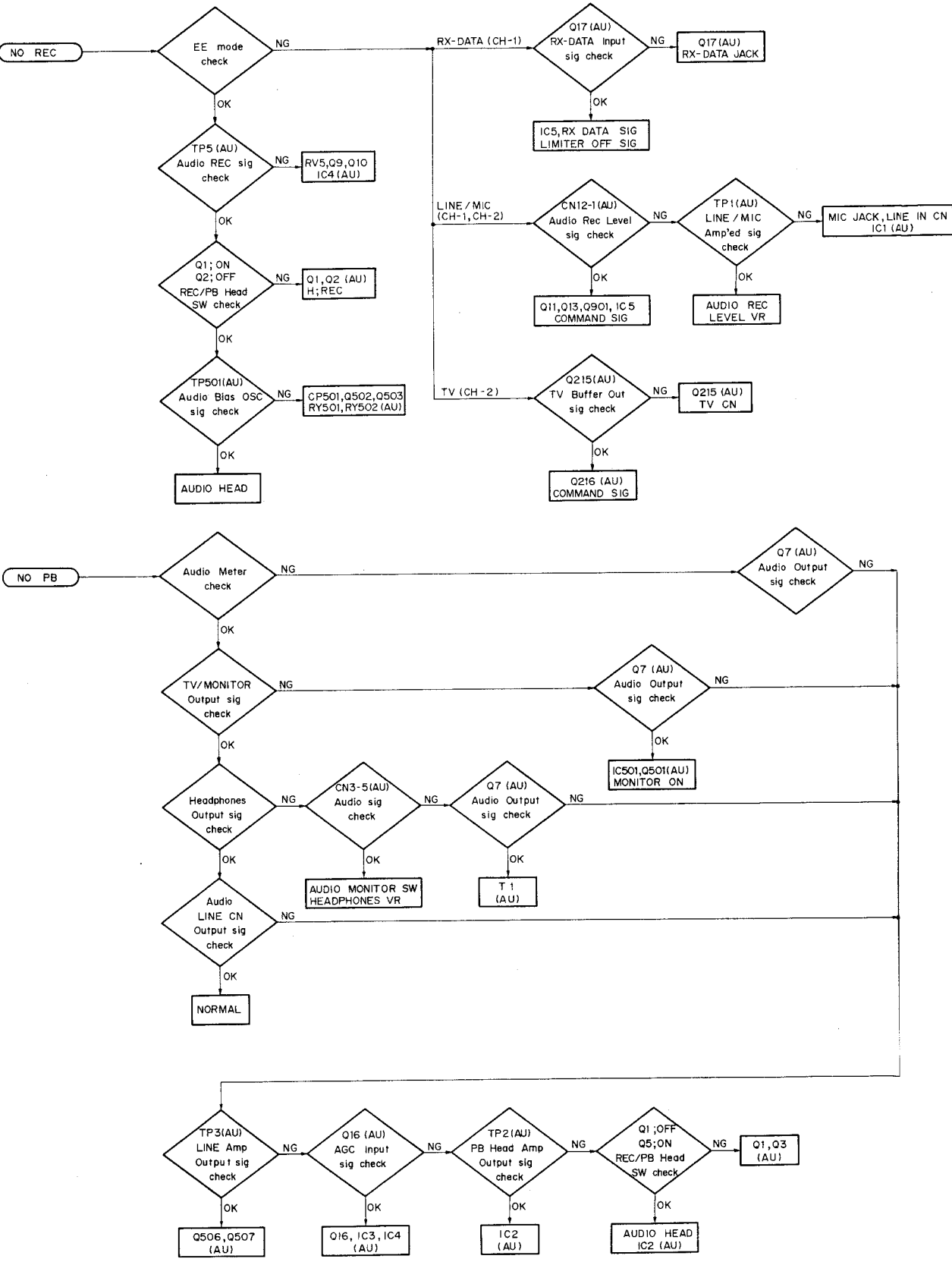
FLOW CHART FLOW CHART



FLOW CHART

AUDIO SYSTEM FLOW CHART

CONDITION ; Clean the Audio Head

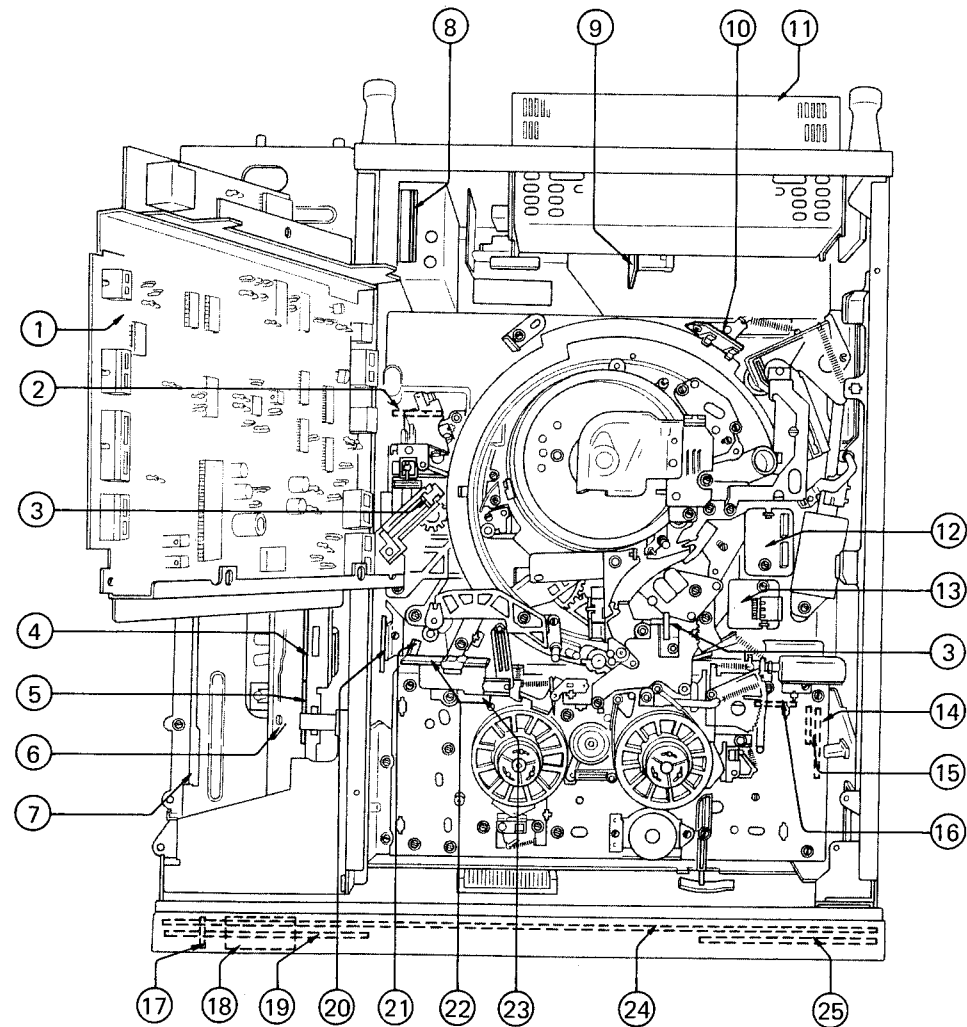


SECTION 14

PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

LOCATION OF MAIN PARTS

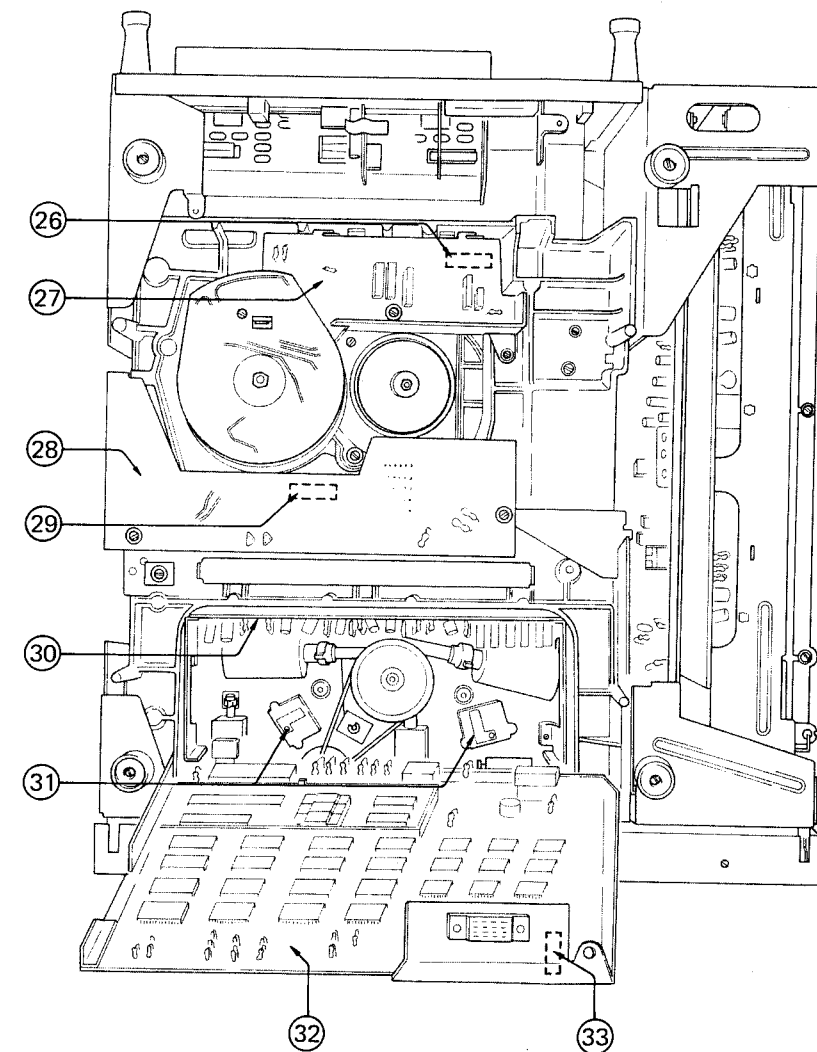
< TOP VIEW >



- ⑨ AC-26 BOARD
- ⑫ AH-3 BOARD
- ⑦ AU-21 BOARD
- ⑤ BS-3 BOARD
- ④ CB-6 BOARD (Mounted on MP-12 board)
- ⑭ CC-9 BOARD (Assembled into cassette-up compartment)
- ⑯ CC-10 BOARD (Assembled into cassette-up compartment)
- ⑮ CC-11 BOARD (Assembled into cassette-up compartment)
- ⑰ DC-10 BOARD

- ④ DL-2 BOARD (Mounted on MP-12 board)
- ⑥ DM-22 BOARD
- ⑮ DP-10 BOARD
- ⑬ EC-19 BOARD
- ⑩ FR-11 BOARD
- ⑰ HP-3 BOARD
- ⑲ KY-13 BOARD
- ② LM-7 BOARD
- ⑱ MC-17 BOARD

< BOTTOM VIEW >



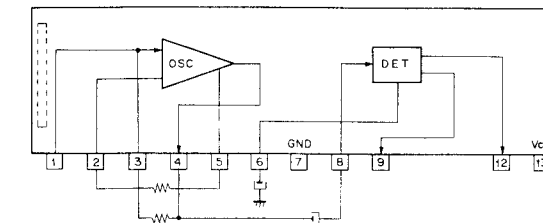
- ⑮ MI-3 BOARD
- ⑳ ML-1 BOARD
- ④ MP-12 BOARD
- ⑳ MR-6 or MR-11 BOARD
- ⑳ PD-16 BOARD
- ⑲ PH-4 BOARD
- ③ PH-5 BOARD
- ⑲ PT-9 (A) BOARD
- ⑲ PT-9 (B) BOARD
- ⑳ PT-9 (C) BOARD
- ⑧ RE-5 BOARD
- ⑲ RS-6 BOARD
- ① SV-31 BOARD
- ⑳ SW-43 BOARD
- ⑲ SW-46 BOARD
- ⑲ SW-50 BOARD
- ⑳ SY-68 BOARD
- ⑪ UR-01

SEMICONDUCTOR ELECTRODES

TYPE	INTERCHANGEABILITY				PAGE
BX343 BX373 BX388 BX3914 BX3915	BX373A				14-4 14-4 14-4 14-4 14-4
CD4001AE/BE CD4011AE/BE CD4013AE/BE CD4015AE/BE	TC4001BP TC4011BP TC4013BP TC4015BP	MB84001B	μPD4001C		14-4 14-4 14-4 14-4
CD4016AE/BE CD4021AE/BE CD4022AE/BE CD4024AE/BE CD4025AE/BE CD4030AE/BE	TC4016BP TC4021BP TC4022BP TC4024BP TC4025BP TC4030BP				14-5 14-5 14-5 14-5 14-5 14-5
CD4042AE/BE CD4051BE CD4053BE CD4066AE/BE CD4069UBE CD4071BE CD4073BE	TC4042BP TC4051BP TC4053BP TC4066BP TC4069UBP TC4071BP TC4073BP	MC14053BCP MB84069B	μPD4071C μPD4073BC		14-6 14-6 14-6 14-6 14-6 14-6 14-6
CD4081BE CD4082BE CD4093BE CX130 CX131A CX134A CX135 CX188 CX859	TC4081BP TC4082BP TC4093BP				14-7 14-7 14-7 14-7 14-7 14-7 14-7 14-7 14-7
CX872 MBM2764-25Z MB8516 MB8747					14-8 14-12 14-8 14-8
M54516P M54517P M54543L MC1330P MC14175BCP MC14503BCP MC14520BCP MC14528BCP MC14538BCP	TC40175BP TC4520BP TC4528BP			HD14538BP	14-9 14-9 14-12 14-9 14-9 14-9 14-9 14-9 14-9
MC14543BCP MSM2128-15RS NJM2903D RC4558 SN16913P SN7404N SN74S138N SN74S139N SN74LS245N	TC4543BP	NJM4558D	μPC4558C		14-10 14-12 14-10 14-10 14-10 14-10 14-10 14-10 14-10
SN74390N SN74LS11N TA7060P TA7069P TC40H368P TL082CP LM324 LM358JG μPC1158H2 μPD444C	TA7060AP TL082ACP/BCP	NJM4559D	μPC324C μPC358C	SN74LS390N CA324 LM358P	14-11 14-12 14-11 14-11 14-11 14-11 14-11 14-11 14-11 14-11

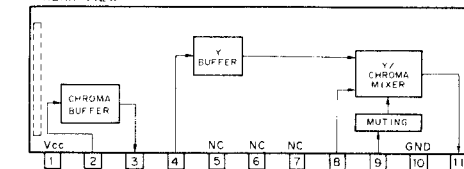
BX343 (SONY)
OSCILLATOR/DETECTOR

— REAR VIEW —



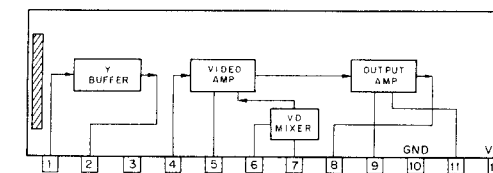
BX373 (SONY)
BX373A (SONY)
MIX AMP

— REAR VIEW —



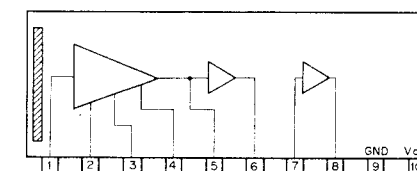
BX388 (SONY)
VIDEO AMP/VD MIXER

— IMPRINTED SIDE —



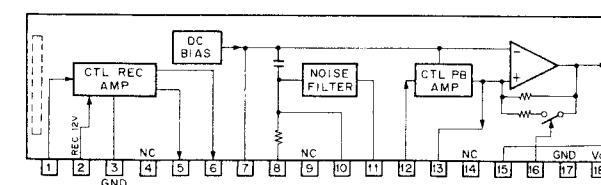
BX389 (SONY)
VIDEO AMPLIFIER

— IMPRINTED SIDE —



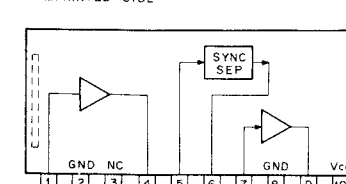
BX3914 (SONY)
CTL REC/PB AMPLIFIER

— IMPRINTED SIDE —

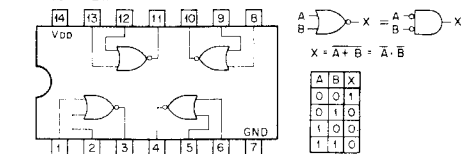


BX3915 (SONY)
SYNC SEPARATOR

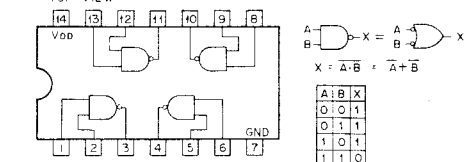
— IMPRINTED SIDE —



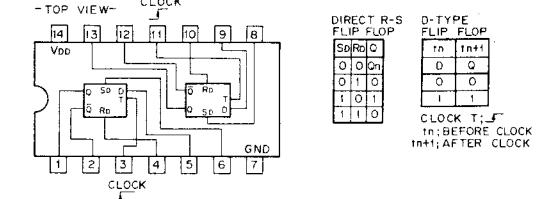
CD4001AE/BE (RCA)
TC4001BP (TOSHIBA)
μPD4001C (NEC)
MB84001B (FUJITSU)
C-MOS 2-INPUT NOR GATE
— TOP VIEW —



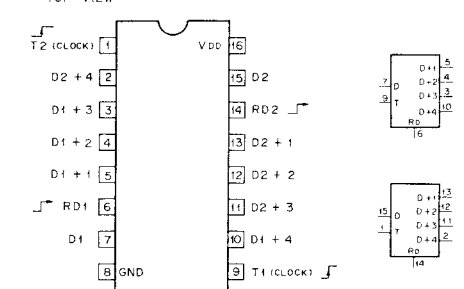
CD4011AE/BE (RCA)
TC4011BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —



CD4013AE/BE (RCA)
TC4013BP (TOSHIBA)
C-MOS D-TYPE FLIP FLOP WITH DIRECT SET / RESET
— TOP VIEW —

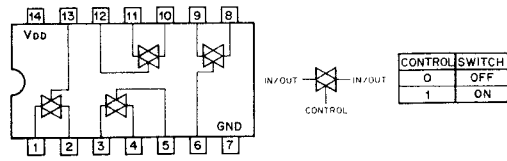


CD4015AE/BE (RCA)
TC4015BP (TOSHIBA)
C-MOS DUAL 4-STAGE STATIC SHIFT REGISTER WITH DIRECT RESET
— TOP VIEW —



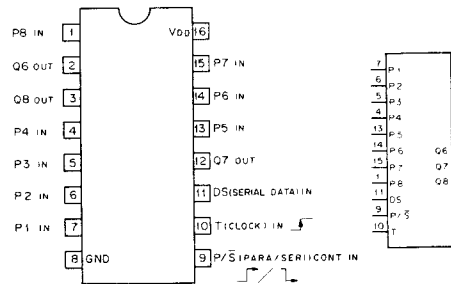
CD4016AE/BE (RCA)
TC4016BP (TOSHIBA)
C-MOS BILATERAL SWITCH

—TOP VIEW—



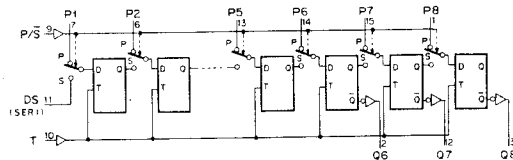
CD4021AE/BE (RCA)
TC4021BP (TOSHIBA)
C-MOS ASYNCHRONOUS PARALLEL/SYNCHRONOUS SERIAL INPUT 8-BIT STATIC SHIFT REGISTER

—TOP VIEW—



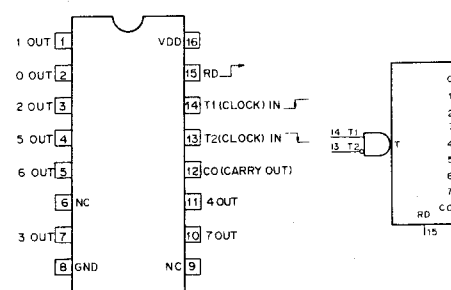
INPUT				INTERNAL OUTPUTS							
P/S CONT	T	P	DS	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
1	X	P1 ~ P8	X	P1	P2	P3	P4	P5	P6	P7	P8
0	F	X	1	Q1n	Q2n	Q3n	Q4n	Q5n	Q6n	Q7n	Q8n
0	F	X	0	Q1n	Q2n	Q3n	Q4n	Q5n	Q6n	Q7n	Q8n
X	0	X	X	Q1n	Q2n	Q3n	Q4n	Q5n	Q6n	Q7n	Q8n

1n: BEFORE CLOCK
1n+1: AFTER CLOCK



CD4022AE/BE (RCA)
TC4022BP (TOSHIBA)
C-MOS OCTAL COUNTER/DIVIDER

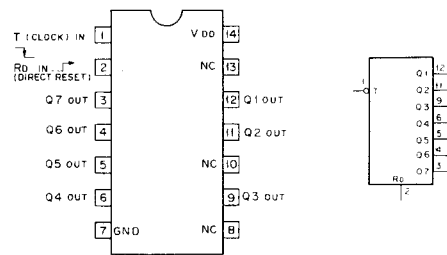
—TOP VIEW—



1: HIGH
0: LOW
X: DON'T CARE

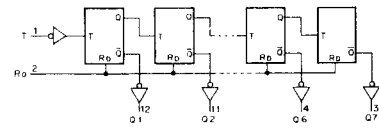
CD4024AE/BE (RCA)
TC4024BP (TOSHIBA)
C-MOS ASYNCHRONOUS 7-BIT BINARY COUNTER

—TOP VIEW—



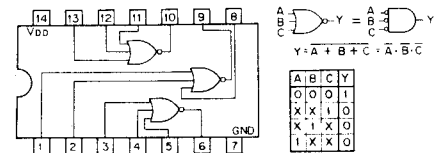
INPUTS		OUTPUTS							
Q7	Q6	Q5	Q4	Q3	Q2	Q1	Q0	Q7	Q6
0	1	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	0
2	0	0	0	0	0	0	1	0	0
3	0	0	0	0	0	1	0	0	0
4	0	0	0	0	1	0	0	0	0
5	0	0	0	1	0	0	0	0	0
6	0	0	1	0	0	0	0	0	0
7	0	1	0	0	0	0	0	0	0
8	1	0	0	0	0	0	0	0	0

0: LOW
1: HIGH
X: DON'T CARE



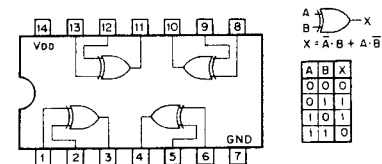
CD4025AE/BE (RCA)
TC4025BP (TOSHIBA)
C-MOS 3-INPUT NOR GATE

—TOP VIEW—



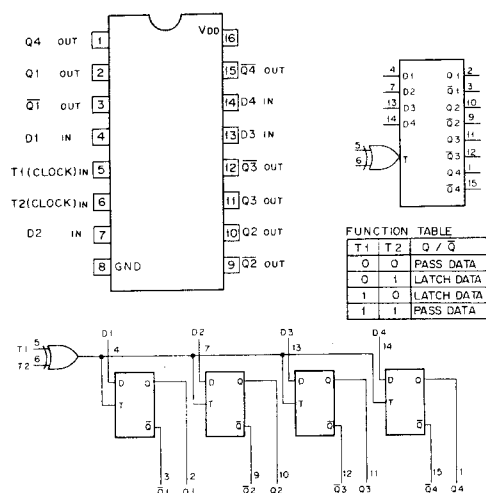
CD4030AE/BE (RCA)
TC4030BP (TOSHIBA)
C-MOS EXCLUSIVE OR GATE

—TOP VIEW—

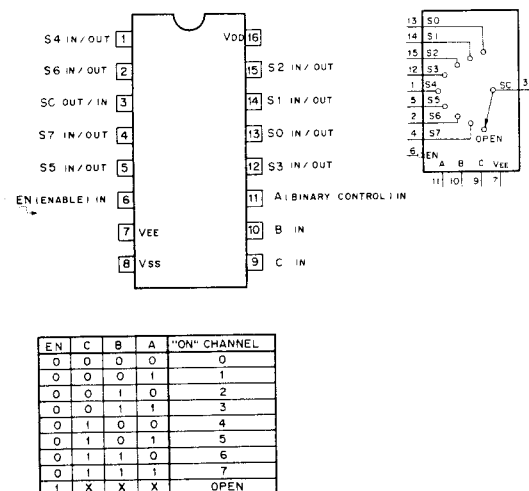


SEMICONDUCTOR ELECTRODES

CD4042AE/BE (RCA)
TC4042BP (TOSHIBA)
C-MOS D-TYPE LATCH
—TOP VIEW—

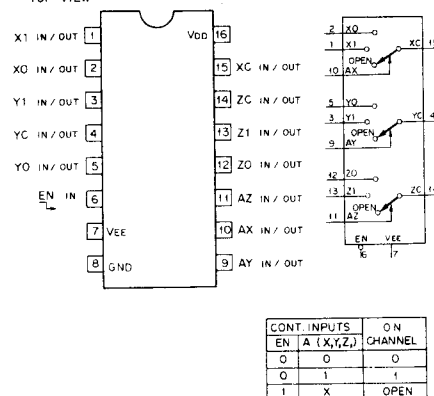


CD4051BE (RCA)
TC4051BP (TOSHIBA)
C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER
—TOP VIEW—

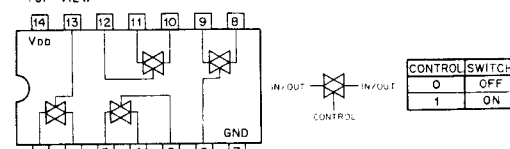


X: DON'T CARE
1: HIGH LEVEL
0: LOW LEVEL

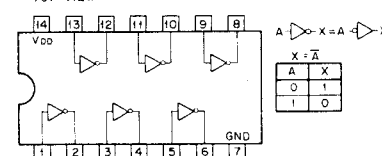
CD4053BE (RCA)
MC14053BP (MOTOROLA)
TC4053BP (TOSHIBA)
C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER
—TOP VIEW—



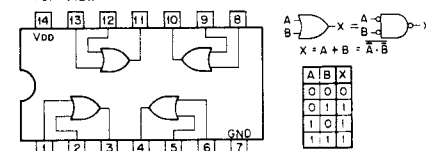
CD4066AE/BE (RCA)
TC4066BP (TOSHIBA)
C-MOS BILATERAL ANALOG SWITCH
—TOP VIEW—



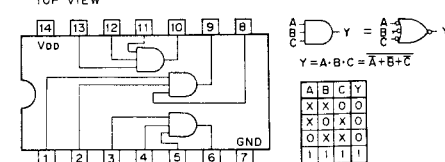
CD4069UBE (RCA)
TC4069UBP (TOSHIBA)
MB84069B (FUJITSU)
C-MOS INVERTER
—TOP VIEW—



CD4071BE (RCA)
TC4071BP (TOSHIBA)
μPD4071C (NEC)
C-MOS 2-INPUT OR GATE
—TOP VIEW—

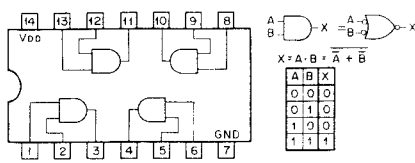


CD4073BE (RCA)
TC4073BP (TOSHIBA)
C-MOS 3-INPUT POSITIVE AND GATE
—TOP VIEW—

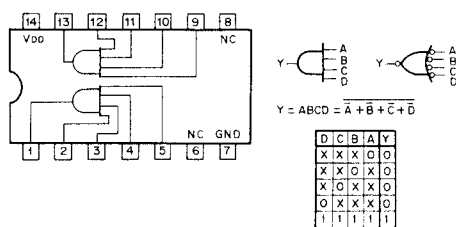


SEMICONDUCTOR ELECTRODES

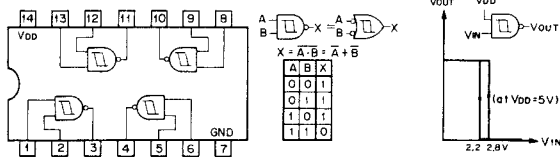
CD4081BE (RCA)
TC4081BP (TOSHIBA)
C-MOS 2-INPUT AND GATE
-TOP VIEW-



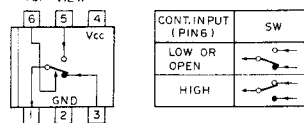
CD4082BE (RCA)
TC4082BP (TOSHIBA)
C-MOS 4-INPUT NAND SCHMITT TRIGGER
-TOP VIEW-



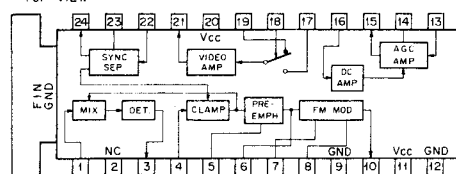
CD4093BE (RCA)
TC4093BP (TOSHIBA)
C-MOS 2-INPUT NAND SCHMITT TRIGGER
-TOP VIEW-



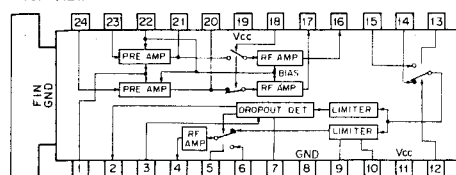
CX130 (SONY)
ANALOG SWITCH
-TOP VIEW-



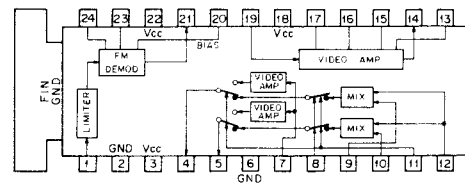
CX131A (SONY)
-TOP VIEW-



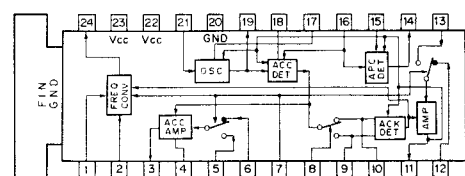
CX134A (SONY)
-TOP VIEW-



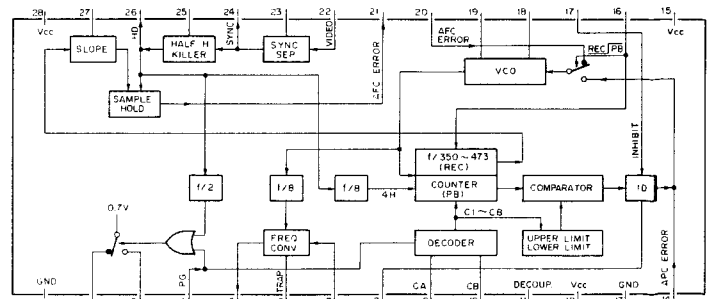
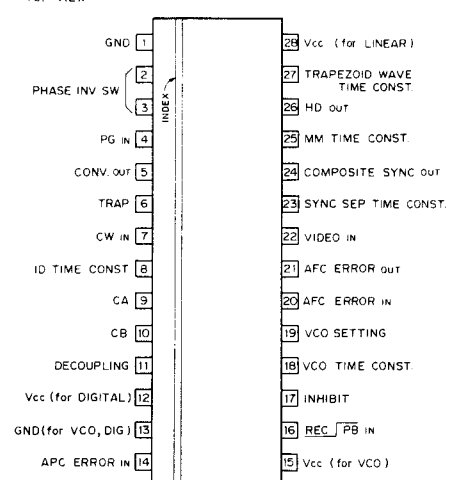
CX135 (SONY)
-TOP VIEW-



CX188 (SONY)
-TOP VIEW-



CX859 (SONY)
-TOP VIEW-



DECODER TRUTH TABLE

CB	LOW	OPEN	HIGH
CA	C1	C7	—
LOW	C1	C7	—
OPEN	C4	C5	C6
HIGH	—	*C2 C3	C8

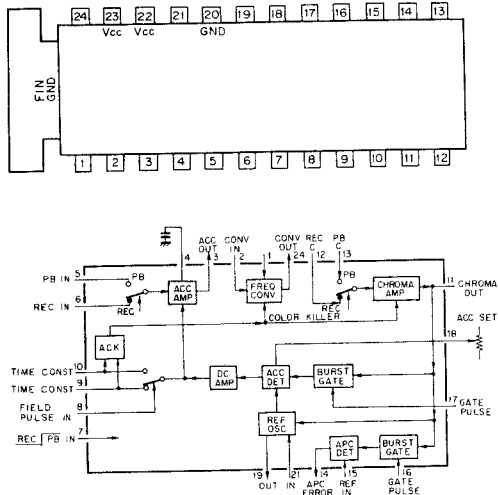
* PG: L --- C2
PG: H --- C3

AFC/APC PRESET DATA

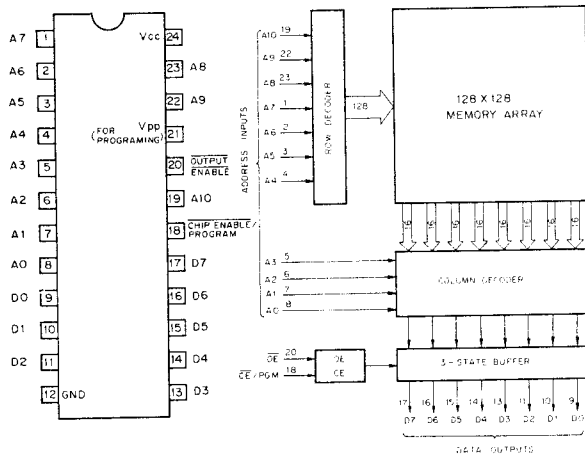
	AFC COUNT DOWN	UPPER LIM	APC ID COUNT LOWER LIM
C1	f/473	105	95
C2	f/351	129	119
C3	f/353	137	127
C4	f/351	118	104
C5	f/351	131	117
C6	f/351	144	130
C7	f/350	136	104
C8	—	125	115

SEMICONDUCTOR ELECTRODES

CXB72 (SONY)
— TOP VIEW —



MB8516 (FUJITSU)
16384-8BIT (2048 X 8) EPROM (3-STATE OUTPUT)
- TOP VIEW -



WORD / ADDRESS TABLE

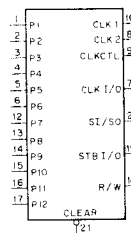
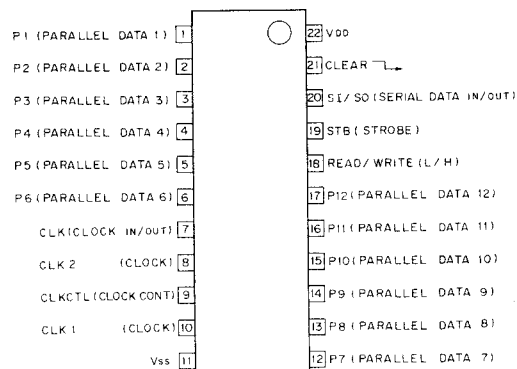
[illegible]

DATA	CODE / ACTUAL DATA
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2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
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32	32
33	33
34	34
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37	37
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41	41
42	42
43	43
44	44
45	45
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47	47
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86	86
87	87
88	88
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90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

DATA CODE	ACTUAL DATA							
	D7	D6	D5	D4	D3	D2	D1	D0
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1	0	1	0	0	0	0	0	1
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3	0	0	0	0	0	0	0	1
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5	0	0	0	0	1	0	0	1
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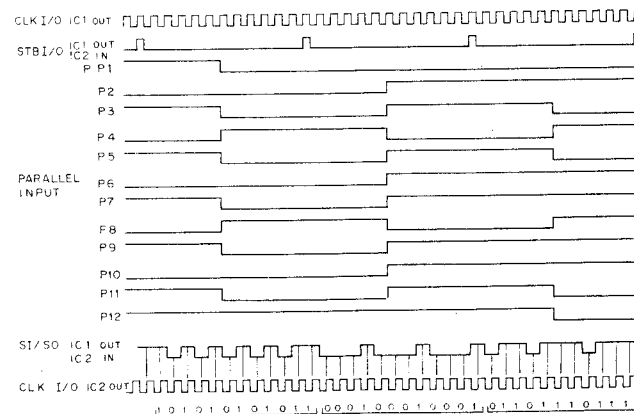
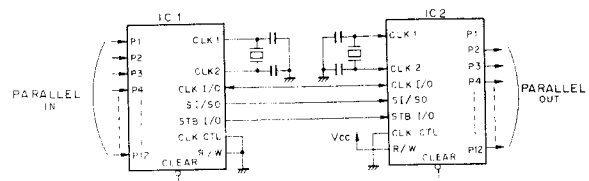
IN DECIMALS

MB 8747 (FUJITSU)
C-MOS SERIAL — PARALLEL CONVERTER WITH OSCILLATOR
— TOP VIEW —



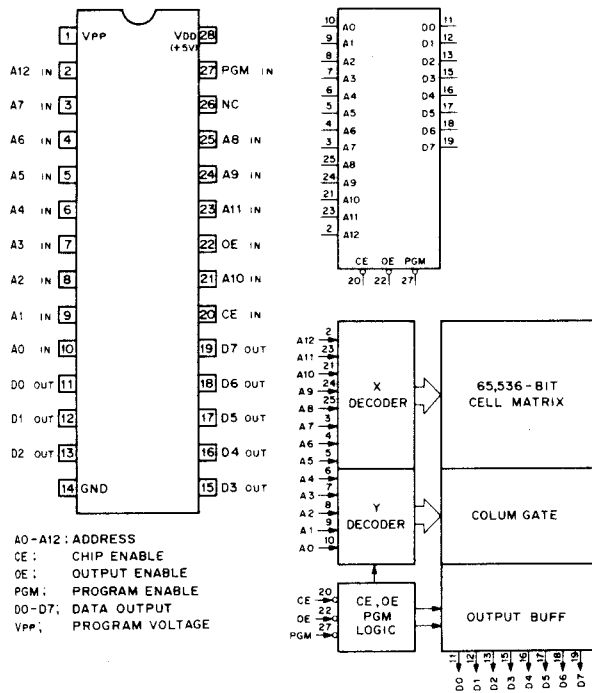
CLK CTL	CLK I/O
0	OUT
1	IN

R/W	SI/SO	PI~PI2	STB I/O
0	OUT	IN	OUT
1	IN	OUT	IN



SEMICONDUCTOR ELECTRODES

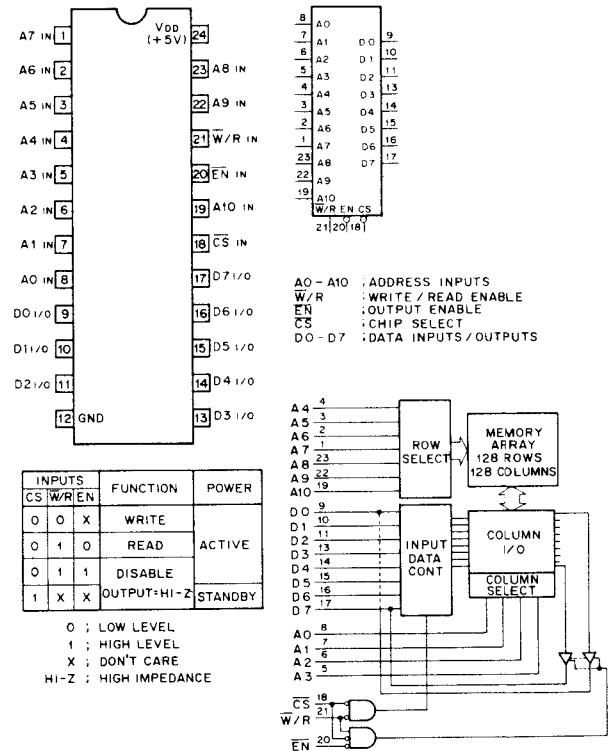
MBM2764-25Z (FUJITSU) (ACCESS TIME = 250 nS)
N-MOS 64K(8K-B) ERASABLE PROM WITH 3-STATE OUTPUTS
— TOP VIEW —



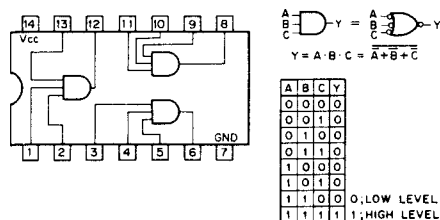
A _n	CE	OE	PGM	V _{PP}	D _n	FUNCTION
A _n	0	0	1	+5V	DENTERED	READ
A _n	0	1	1	+5V	HI-Z	OUTPUT DISABLE
A _n	0	0	0	+5V	HI-Z	OUTPUT DISABLE
X	1	X	X	+5V	HI-Z	STANDBY
A _n	0	X	1	+21V	D _n	PGM
A _n	0	0	1	+21V	DENTERED	PGM VERIFY
X	1	X	X	+21V	HI-Z	PGM INH

0: LOW LEVEL
1: HIGH LEVEL
X: DON'T CARE
HI-Z: HIGH IMPEDANCE

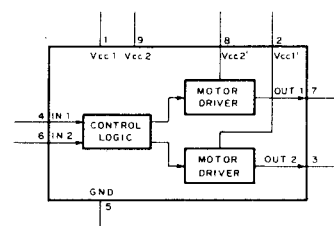
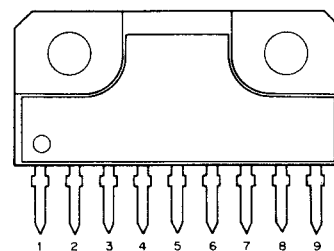
MSM2128-15RS (OKI) (ACCESS TIME = 150 nS)
N-MOS 16384(2048x8)-BIT STATIC RAM
— TOP VIEW —



SN74LS11N (TI)
TTL 3-INPUT POSITIVE-AND GATE
— TOP VIEW —



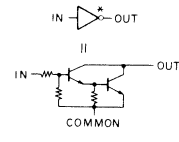
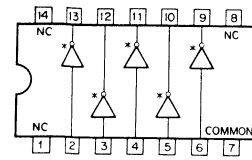
M54543L (MITSUBISHI)
BI-DIRECTIONAL MOTOR DRIVER
— SIDE VIEW —



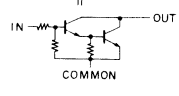
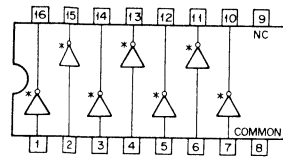
IN		OUT		MODE
1	2	1	2	
0	0	2	2	NO OPERATION
1	0	1	0	ROTATION
0	1	0	1	REVERSE ROTATION
1	1	0	0	BRAKE

0: LOW LEVEL
1: HIGH LEVEL
2: HIGH IMPEDANCE

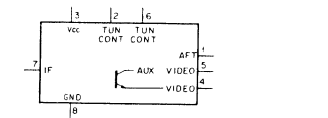
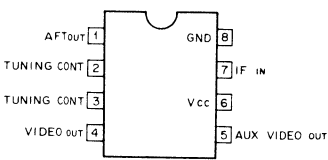
M54516P (MITSUBISHI)
TRANSISTOR ARRAY
— TOP VIEW —



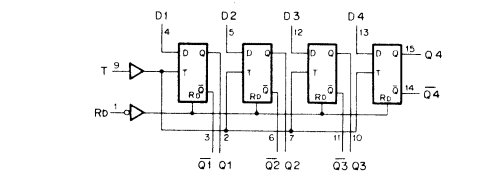
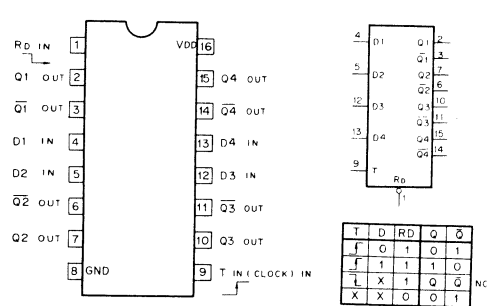
M54517P (MITSUBISHI)
TRANSISTOR ARRAY
— TOP VIEW —



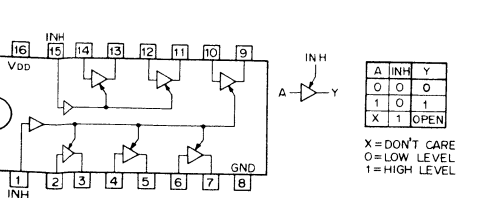
MC1330P (MOTOROLA)
LOW-LEVEL VIDEO DETECTOR
— TOP VIEW —



MC14175BCP (MOTOROLA)
TC40175BP (TOSHIBA)
C-MOS D-TYPE FLIP-FLOP
— TOP VIEW —



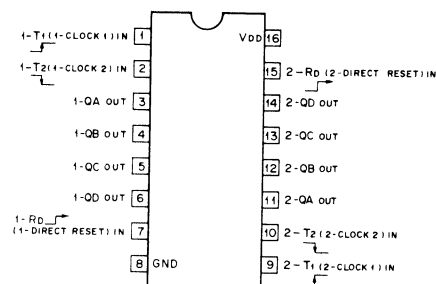
MC145038CP (MOTOROLA)
C-MOS NON-INVERTING 3-STATE BUFFER
— TOP VIEW —



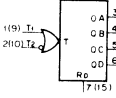
A	INH	Y
0	0	0
1	0	1
X	1	OPEN

X=DON'T CARE
0=LOW LEVEL
1=HIGH LEVEL

MC14520BCP (MOTOROLA)
TC4520BP (TOSHIBA)
C-MOS DUAL 4-BIT BINARY UP COUNTER
— TOP VIEW —

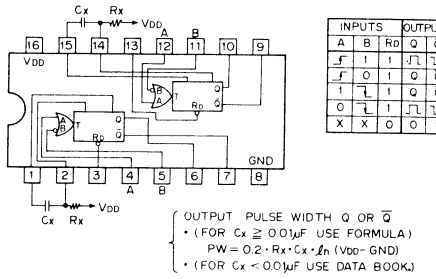


STATE	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Q0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
Q1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
Q2	0	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1
Q3	0	0	0	0	1	1	1	0	0	1	1	1	0	0	1	1

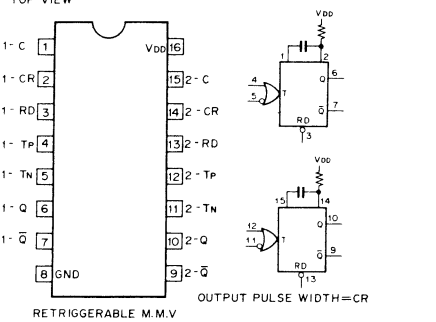


T1	T2	Rd	ACTION
0	0	0	INCREMENT COUNTER
0	0	1	INCREMENT COUNTER
0	1	0	NO CHANGE
0	1	1	NO CHANGE
1	0	0	NO CHANGE
1	0	1	NO CHANGE
1	1	0	NO CHANGE
1	1	1	NO CHANGE

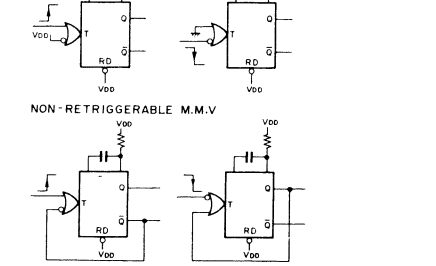
MC14528BCP (MOTOROLA)
TC4528BP (TOSHIBA)
C-MOS RETRIGGERABLE / RESETTABLE MMV
— TOP VIEW —



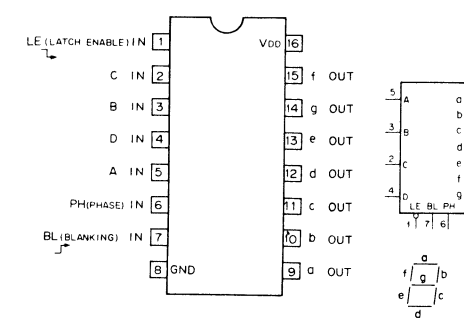
MC14538BCP (MOTOROLA)
HD14538BP (HITACHI)
C-MOS DUAL MONOSTABLE MULTIVIBRATOR
— TOP VIEW —



MC145038CP (MOTOROLA)
C-MOS NON-INVERTING 3-STATE BUFFER
— TOP VIEW —

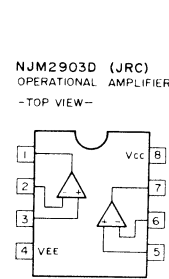


MC14543BCP (MOTOROLA)
TC4543BP (TOSHIBA)
C-MOS BCD-TO-SEVEN-SEGMENT LATCH / DECODER / DRIVER
— TOP VIEW —

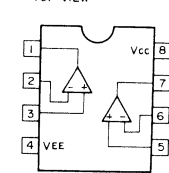


INPUTS	BL	PH	D	C	B	A	Q	b	c	d	e	f	g	DISPLAY
0	0	0	0	0	0	0	0	0	0	0	0	0	0	BLANK
1	0	0	0	0	0	0	1	1	1	1	1	1	1	0
2	0	0	0	0	0	1	0	1	1	0	0	0	0	1
3	0	0	0	0	1	0	0	1	1	0	0	0	0	1
4	0	0	0	1	0	0	0	1	1	0	0	0	0	1
5	0	0	0	1	0	1	0	0	0	1	1	0	0	1
6	0	0	0	1	1	0	0	0	0	1	1	0	0	1
7	0	0	0	1	1	0	1	0	0	0	0	1	0	1
8	0	0	1	0	0	0	0	0	1	1	0	0	0	1
9	0	0	1	0	0	1	0	0	0	0	1	1	0	1
10	0	0	1	0	1	0	0	0	0	1	1	0	0	1
11	0	0	1	0	1	0	1	0	0	0	0	1	1	1
12	0	0	1	1	0	0	0	0	1	1	0	0	0	1
13	0	0	1	1	0	1	0	0	0	0	1	1	0	1
14	0	0	1	1	1	0	0	0	0	1	1	0	0	1
15	0	0	1	1	1	0	1	0	0	0	0	1	1	1
16	0	0	1	1	1	1	0	0	0	0	0	1	1	1

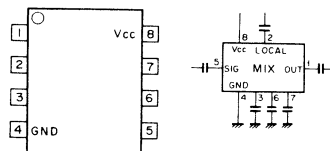
NJM2903D (JRC)
OPERATIONAL AMPLIFIER
— TOP VIEW —



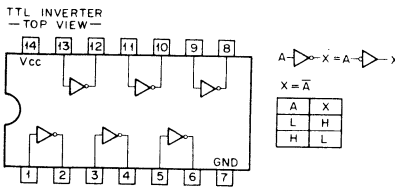
NJM4558D (JRC)
μPC4558C (NEC)
OPERATIONAL AMPLIFIER
— TOP VIEW —



SN16913P (TI)
BALANCED MIXER
— TOP VIEW —

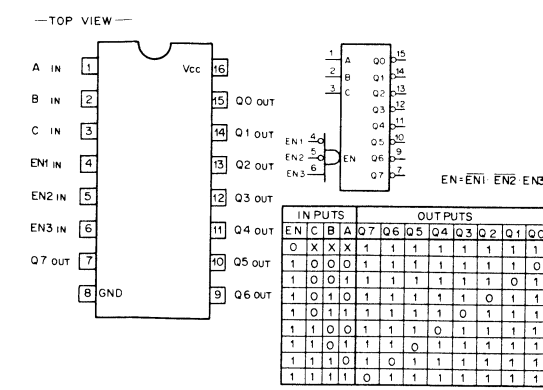


SN7404N (TI)
SN74LS04N (TI)
TTL INVERTER
— TOP VIEW —

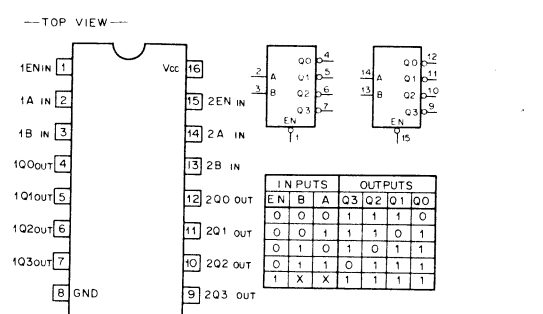


A	X	Y
0	0	1
1	1	0
X	X	X

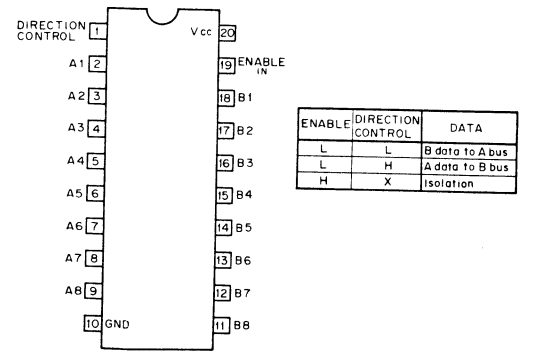
SN74S138N (TI)
SN74LS138N (TI)
TTL 3-TO-8-LINE DECODER/DEMULPLEXER
— TOP VIEW —



SN74S139N (TI)
SN74LS139N (TI)
TTL 2-TO-4-LINE DECODER/DEMULPLEXER
— TOP VIEW —

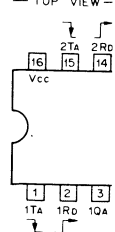


SN74LS245N (TI)
TTL OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUT
— TOP VIEW —



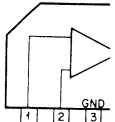
ENABLE	DIRECTION CONTROL	DATA
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

SN74S390N (TI)
TTL DIVIDE-BY-10
— TOP VIEW —

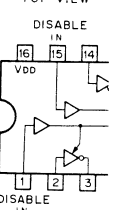


COUNT	Q0	Q1	Q2	Q3
0	0	0	0	0
1	1	0	0	0
2	0	1	0	0
3	1	1	0	0
4	0	0	1	0
5	1	0	1	0
6	0	1	1	0
7	1	1	1	0
8	0	0	0	1
9	1	0	0	1

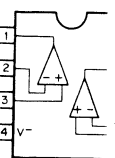
TA7060P (T)
TA7060AP (T)
LINEAR AMP
— SIDE VIEW —



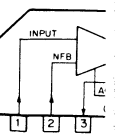
TC40H368P (T)
C-MOS INVERTER
— TOP VIEW —



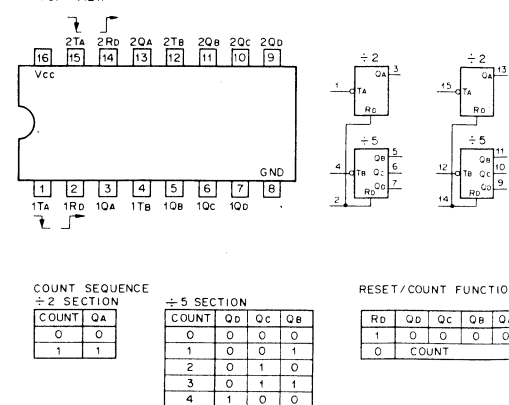
TL082CP (T)
OPERATIONAL AMPLIFIER (JFET-INPUT)
— TOP VIEW —



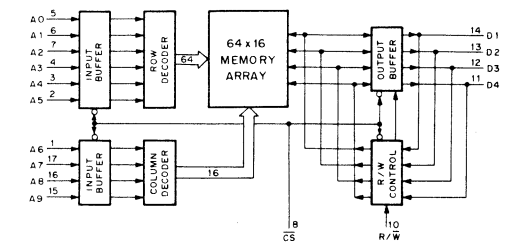
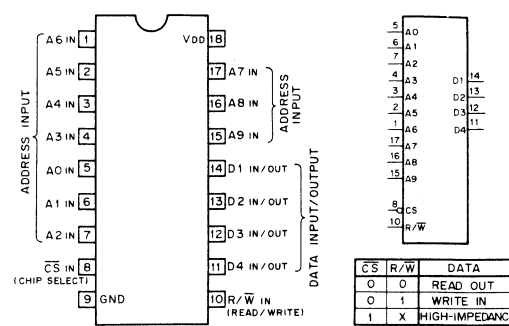
μPC1158H2 (NE)
LOW NOISE PREAMP
— SIDE VIEW —



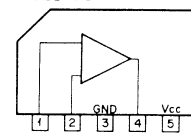
SN74390N (TI)
SN74LS390N (TI)
TTL DIVIDE-BY-2 AND DIVIDE-BY-5 COUNTER
— TOP VIEW —



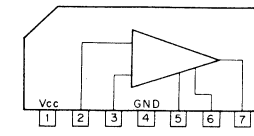
μPD444C (NEC)
C-MOS 4096-BIT (1024x4) STATIC RAM
— TOP VIEW —



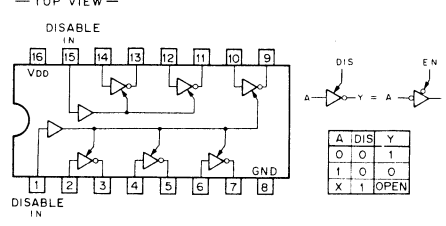
TA7060P (TOSHIBA)
TA7060AP (TOSHIBA)
LINEAR AMP
— SIDE VIEW —



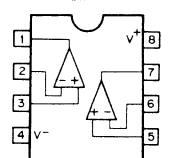
TA7069P (TOSHIBA)
VIDEO AMPLIFIER
— SIDE VIEW —



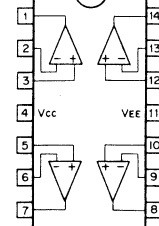
TC40H368P (TOSHIBA)
C-MOS INVERTING 3-STATE BUFFER
— TOP VIEW —



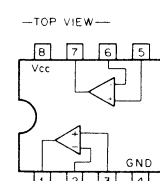
TLO82CP (TI)
OPERATIONAL AMPLIFIER
(JFET-INPUT)
— TOP VIEW —



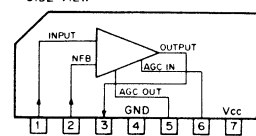
μPC324C (NEC)
QUAD. OP. AMPLIFIER
— TOP VIEW —



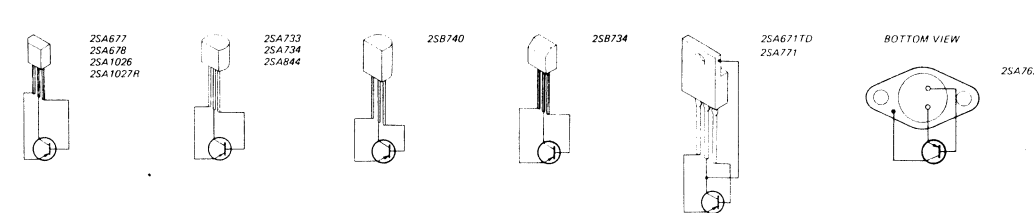
LM358P (TI)
μPC358C (NEC)
DUAL OPERATIONAL AMPLIFIERS
— TOP VIEW —



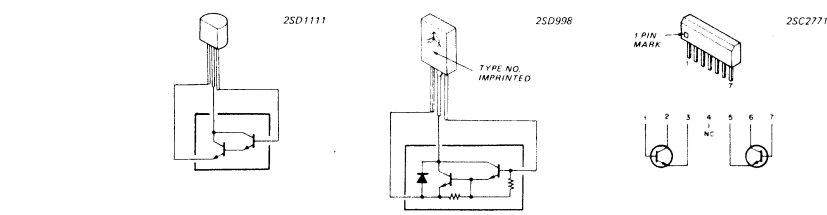
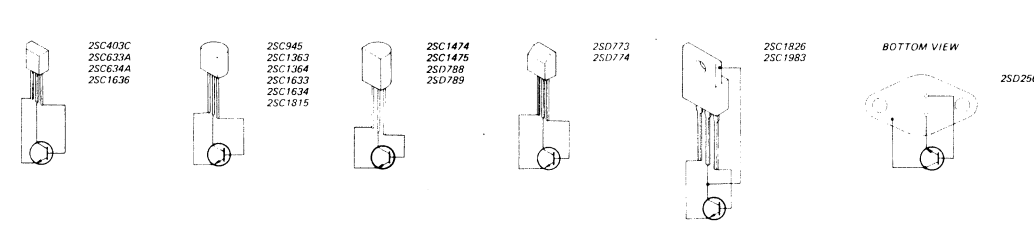
μPC1158H2 (NEC)
LOW NOISE PREAMPLIFIER WITH AGC
— SIDE VIEW —



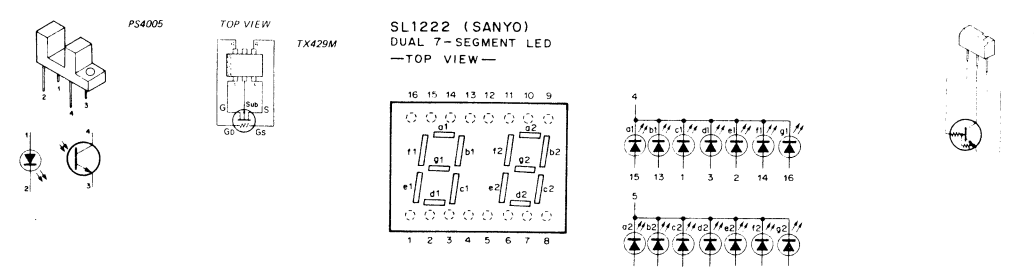
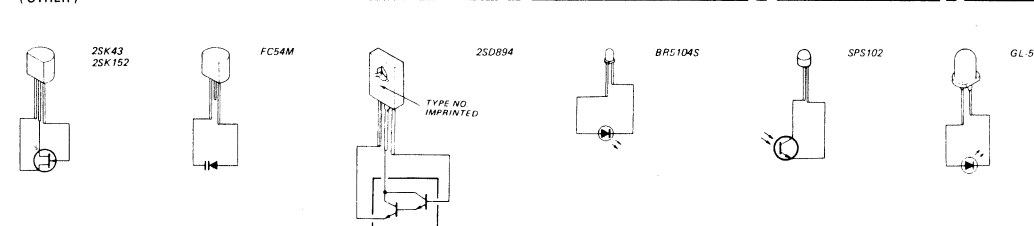
(2SA... , 2SB...)



(2SC... , 2SD...)



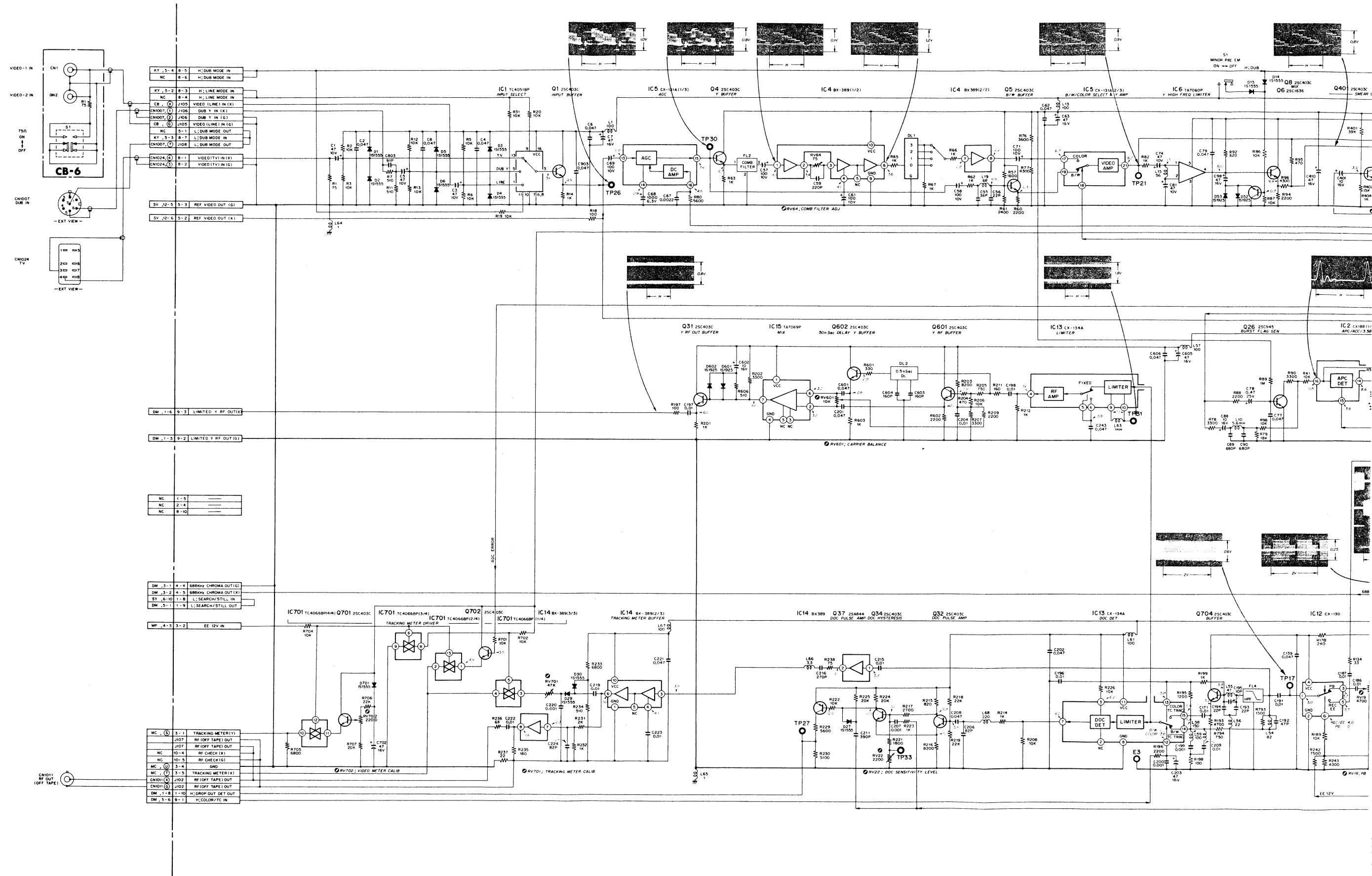
(OTHER)

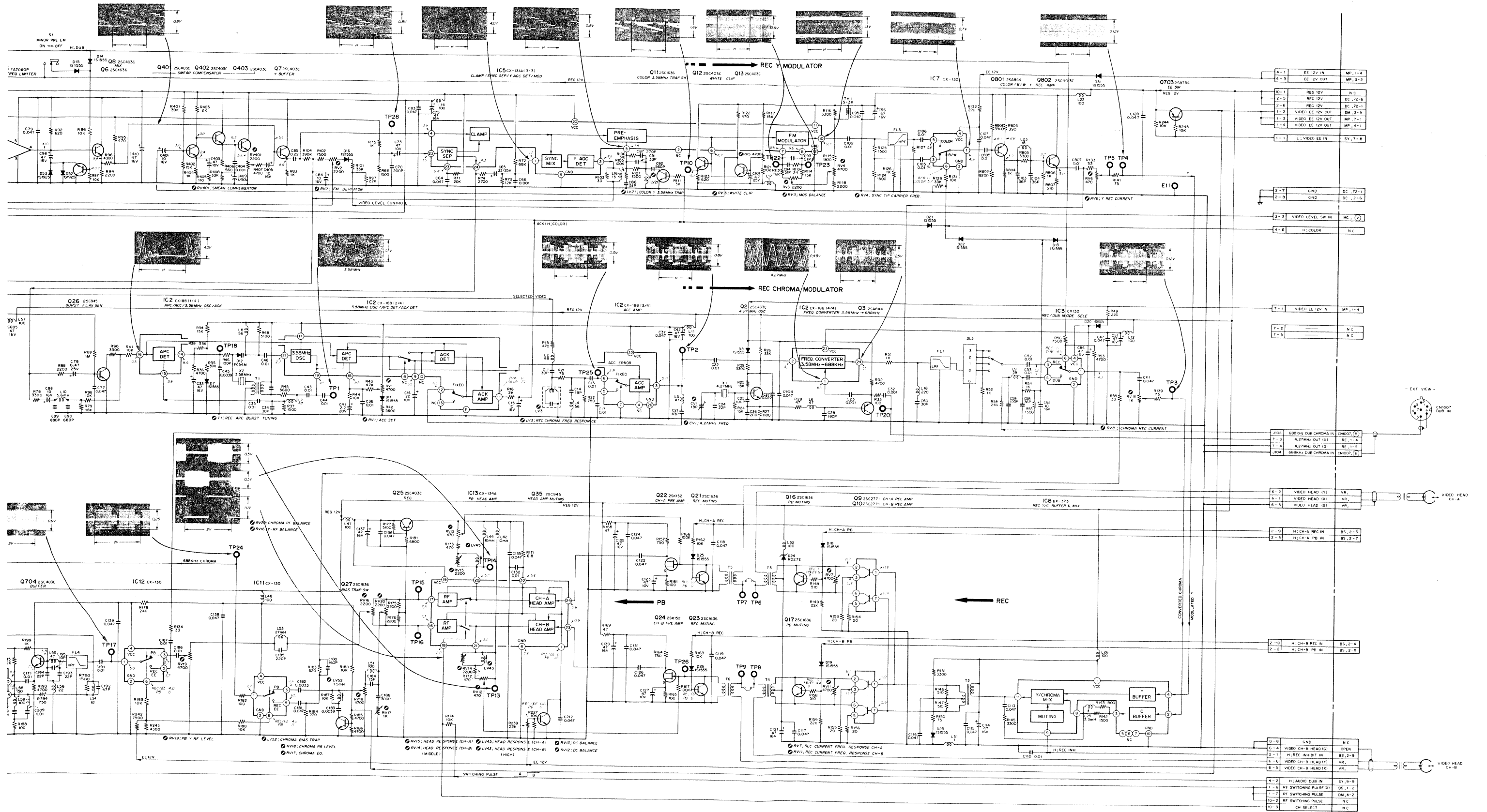


MP-12/CB-6

MP-12
(VIDEO MODULATOR)
CB-6

S/N UP TO 10440 (USA)
S/N UP TO 20110 (CND)





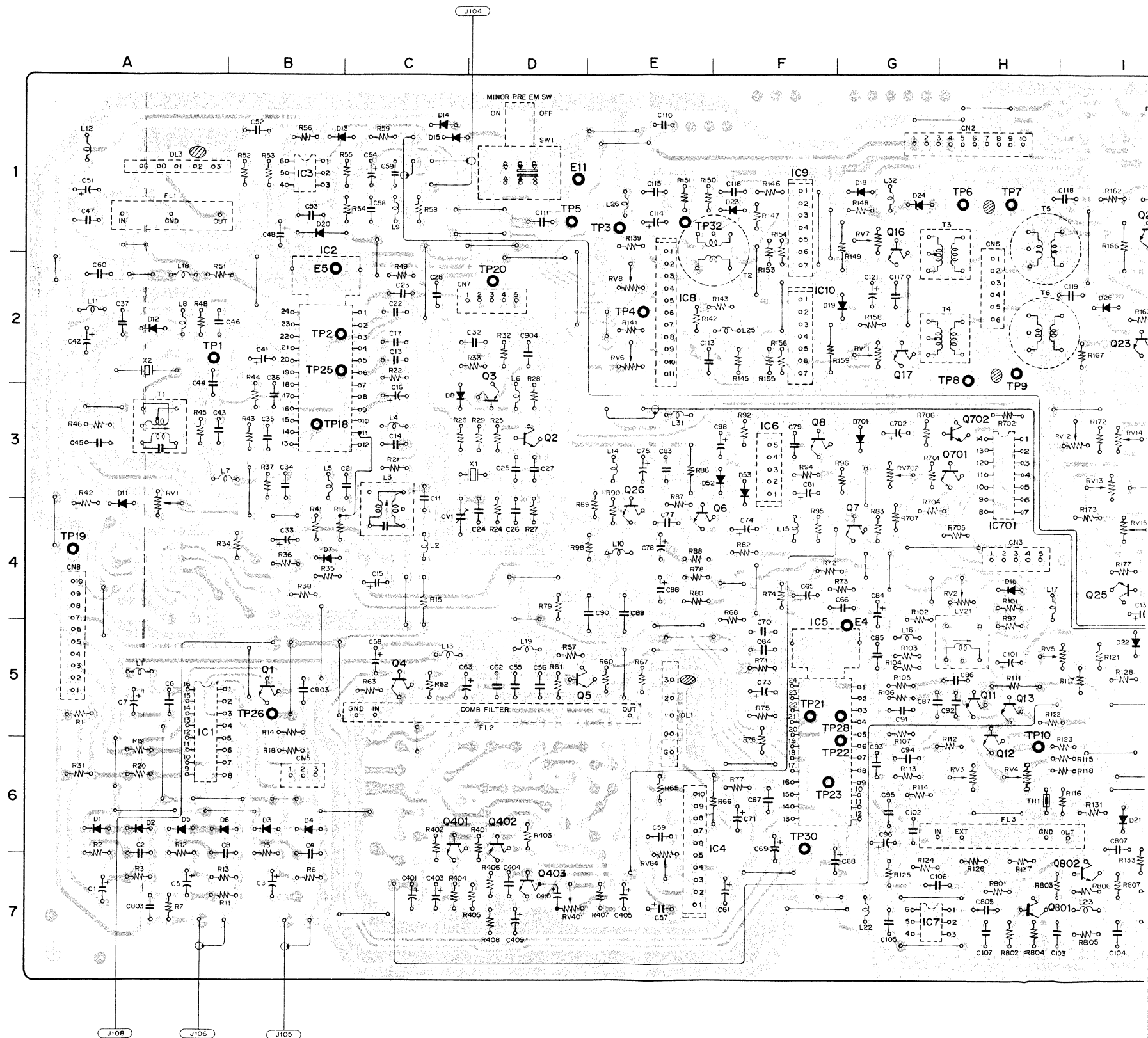
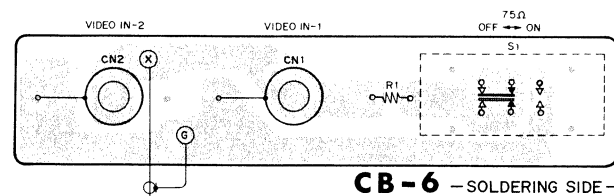
MP-12 (VIDEO MODULATOR)

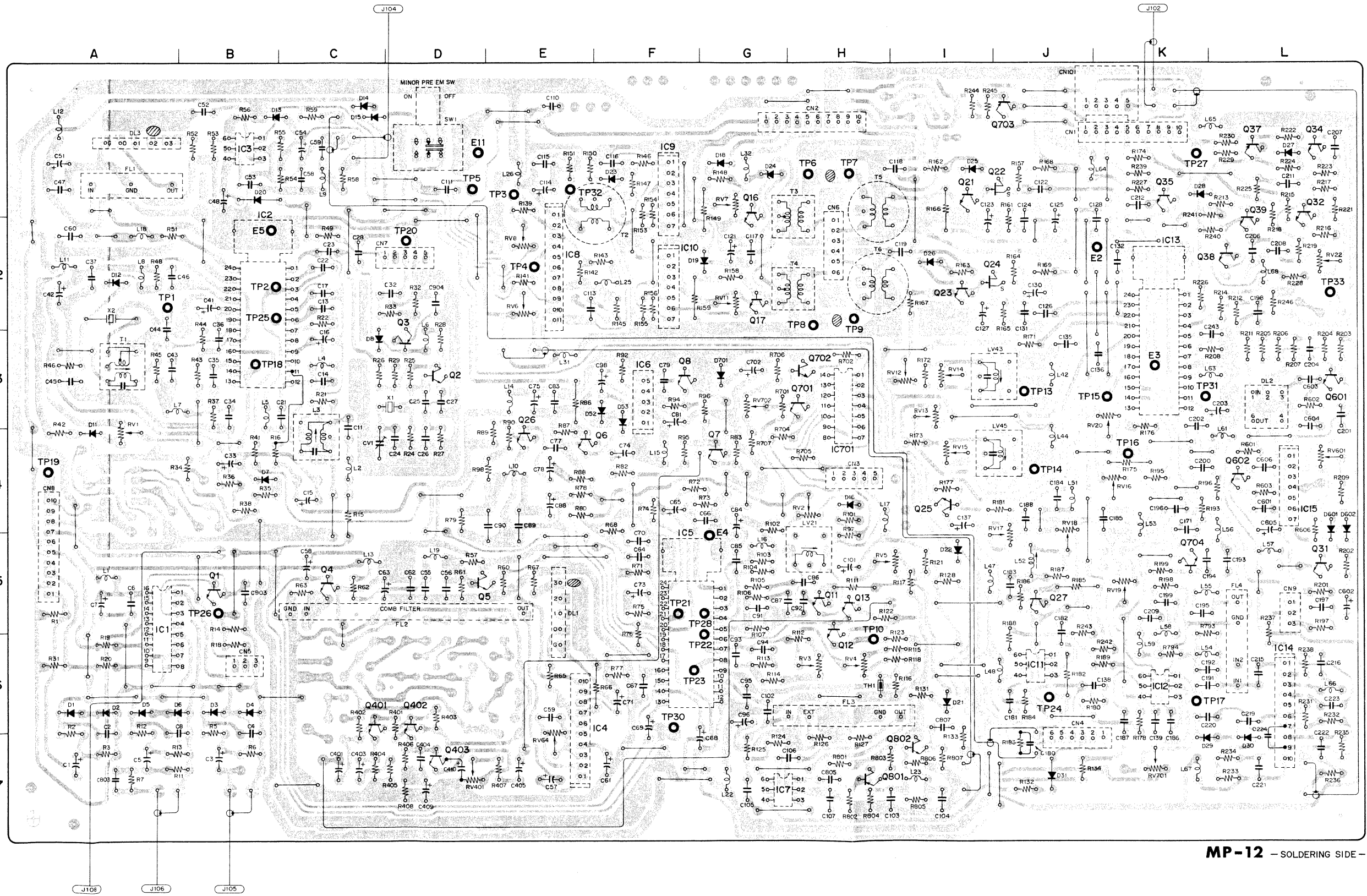
CB-6

S/N UP TO 10140 (USA)

S/N UP TO 20010 (CND)

CN1	K-1	IC1	A-5	RV1	A-4
CN2	H-1	IC2	B-2	RV2	H-4
CN3	H-4	IC3	B-1	RV3	H-6
CN4	J-7	IC4	E-6	RV4	H-6
CN5	B-6	IC5	F-5	RV5	H-5
CN6	H-2	IC6	F-3	RV6	E-2
CN7	D-2	IC7	G-7	RV7	G-1
CN8	A-5	IC8	E-2	RV8	E-2
CN9	L-5	IC9	F-1	RV11	G-2
CN10	K-1	IC10	F-2	RV12	I-3
		IC11	J-6	RV13	I-3
CV1	C-4	IC12	K-6	RV14	I-3
		IC13	K-3	RV15	I-4
D1	A-6	IC14	L-6	RV16	K-4
D2	A-6	IC15	L-4	RV17	J-5
D3	B-6	IC701	H-3	RV18	J-5
D4	B-6			RV19	K-5
D5	A-6	L3	C-4	RV20	K-3
D6	A-6	L52	J-5	RV22	L-2
D7	B-4			RV64	E-7
D8	C-3	LV21	H-5	RV401	D-7
D11	A-4	LV43	J-3	RV601	L-4
D12	A-2	LV45	J-4	RV701	K-7
D13	B-1			RV702	G-3
D14	C-1	Q1	B-5	SW1	D-1
D15	C-1	Q2	D-3		
D16	H-4	Q3	D-3	T1	A-3
D18	G-1	Q4	C-5	T2	E-1
D19	G-2	Q5	D-5	T3	H-1
D20	B-1	Q6	E-4	T4	H-2
D21	I-6	Q7	G-4	T5	H-1
D22	I-5	Q8	F-3	T6	H-2
D23	F-1	Q11	H-5		
D24	G-1	Q12	H-6	TP1	A-2
D25	I-1	Q13	H-5	TP2	B-2
D26	I-2	Q16	G-1	TP3	E-1
D27	L-1	Q17	G-2	TP4	E-2
D28	K-1	Q21	I-1	TP5	D-1
D29	L-6	Q22	J-1	TP6	H-1
D30	L-6	Q23	I-2	TP7	H-1
D31	J-7	Q24	J-2	TP8	H-2
D52	F-3	Q25	I-4	TP9	H-6
D53	F-3	Q26	E-4	TP10	H-6
D601	L-4	Q27	J-5	TP13	J-3
D602	L-4	Q31	L-5	TP14	J-4
D701	G-3	Q32	L-1	TP15	K-3
		Q34	L-1	TP16	K-4
DL1	E-5	Q35	K-1	TP17	K-6
DL2	L-3	Q37	L-1	TP18	B-3
DL3	A-1	Q38	L-2	TP19	A-4
		Q39	L-1	TP20	D-2
E2	K-2	Q401	C-6	TP21	F-5
E3	K-3	Q402	D-6	TP22	G-6
E4	G-5	Q403	D-7	TP23	F-6
E5	B-2	Q601	L-3	TP24	J-6
E11	D-1	Q602	L-4	TP25	B-2
		Q701	H-3	TP26	B-5
FL1	A-1	Q702	H-3	TP27	K-1
FL2	D-5	Q703	J-1	TP28	G-5
FL3	H-6	Q704	K-5	TP30	F-6
FL4	L-5	Q801	H-7	TP31	K-3
		Q802	I-7	TP32	E-1
				TP33	L-2
				X1	D-3
				X2	A-2

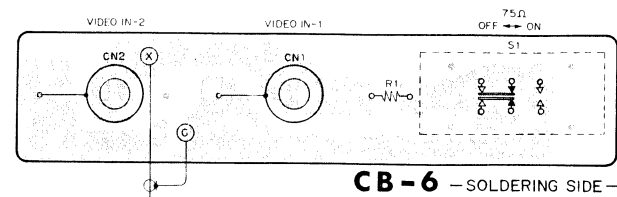




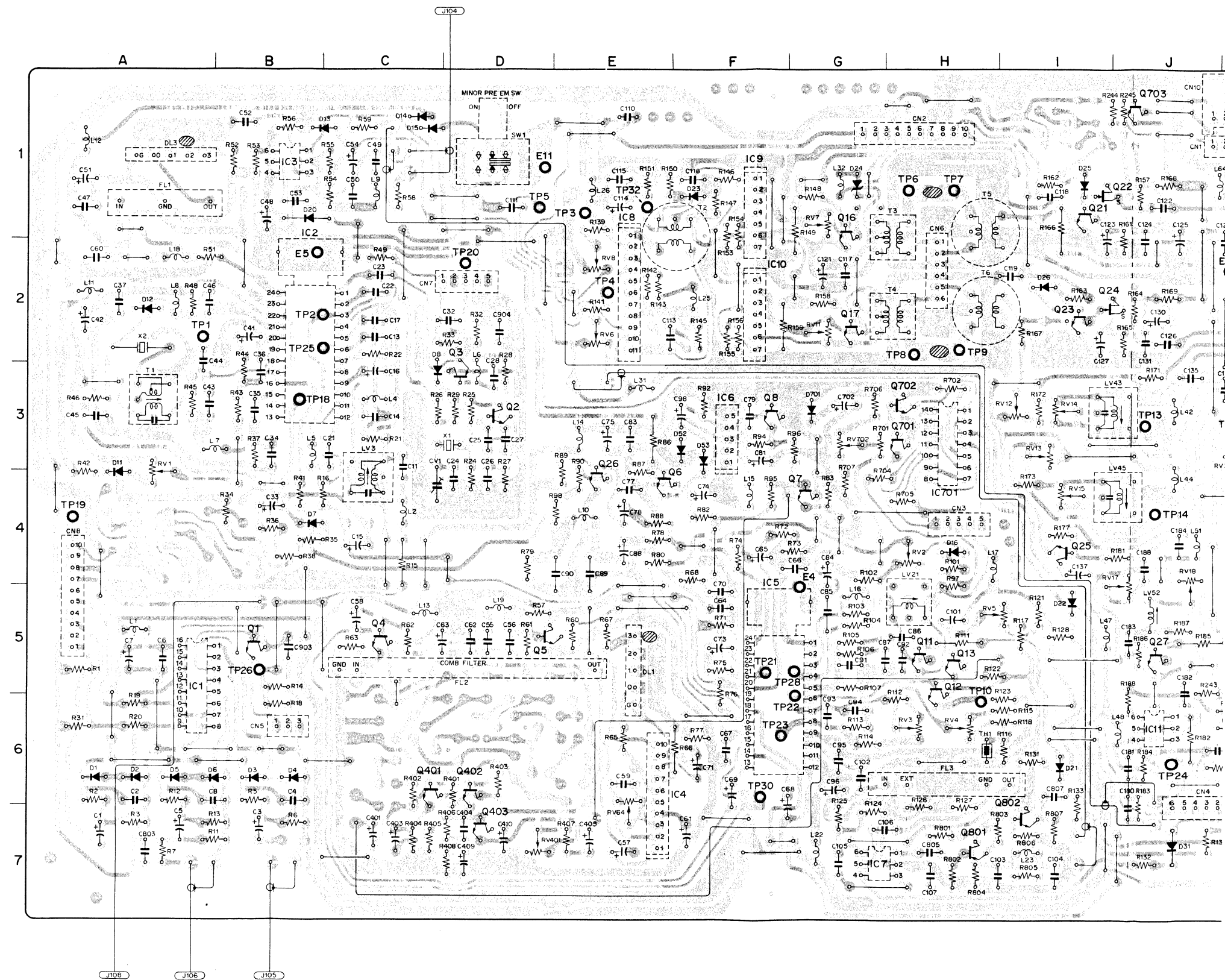
MP-12 - SOLDERING SIDE -

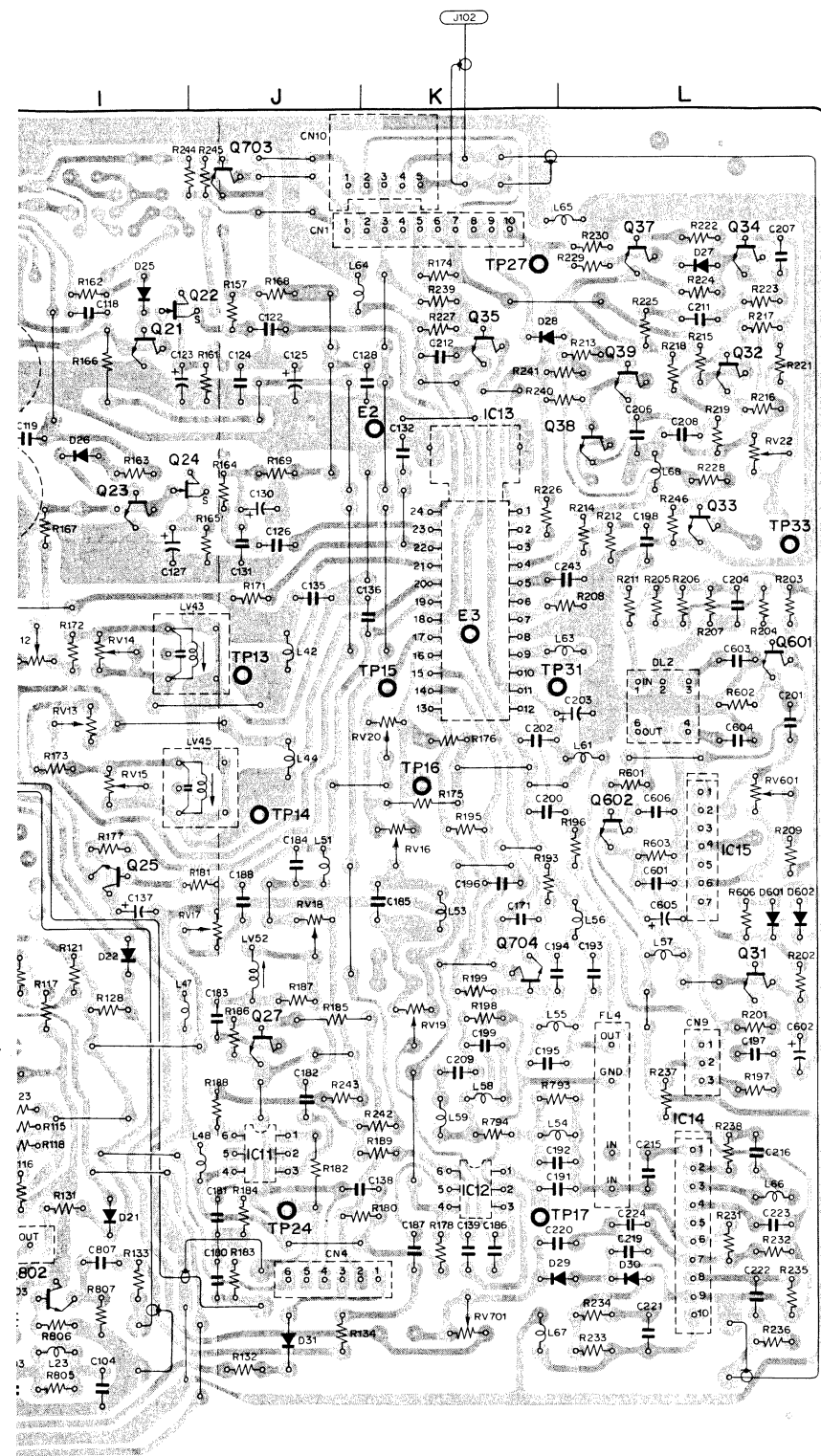
MP-12 (VIDEO DEMODULATOR)
CB-6S/N 10141 ~ 13690 (USA)
S/N 20011 ~ 20210 (CND)

CN1	K-1	IC1	A-5	RV1	A-4
CN2	H-1	IC2	B-2	RV2	H-4
CN3	H-4	IC3	B-1	RV3	H-6
CN4	J-7	IC4	E-6	RV4	H-6
CN5	B-6	IC5	F-5	RV5	H-5
CN6	H-2	IC6	F-3	RV6	E-2
CN7	D-2	IC7	G-7	RV7	G-1
CN8	A-5	IC8	E-2	RV8	E-2
CN9	L-5	IC9	F-1	RV11	G-2
CN10	K-1	IC10	F-2	RV12	I-3
		IC11	J-6	RV13	I-3
CV1	C-4	IC12	K-6	RV14	I-3
		IC13	K-3	RV15	I-4
D1	A-6	IC14	L-6	RV16	K-4
D2	A-6	IC15	L-4	RV17	J-5
D3	B-6	IC701	H-3	RV18	J-5
D4	B-6			RV19	K-5
D5	A-6	L3	C-4	RV20	K-3
D6	A-6	L52	J-5	RV22	L-2
D7	B-4			RV64	E-7
D8	C-3	LV21	H-5	RV401	D-7
D11	A-4	LV43	J-3	RV601	L-4
D12	A-2	LV45	J-4	RV701	K-7
D13	B-1			RV702	G-3
D14	C-1	Q1	B-5	SW1	D-1
D15	C-1	Q2	D-3		
D16	H-4	Q3	D-3	T1	A-3
D18	G-1	Q4	C-5	T2	E-1
D19	G-2	Q5	D-5	T3	H-1
D20	B-1	Q6	E-4	T4	H-2
D21	I-6	Q7	G-4	T5	H-1
D22	I-5	Q8	F-3	T6	H-2
D23	F-1	Q11	H-5		
D24	G-1	Q12	H-6	TP1	A-2
D25	I-1	Q13	H-5	TP2	B-2
D26	I-2	Q16	G-1	TP3	E-1
D27	L-1	Q17	G-2	TP4	E-2
D28	K-1	Q21	I-1	TP5	D-1
D29	L-6	Q22	J-1	TP6	H-1
D30	L-6	Q23	I-2	TP7	H-1
D31	J-7	Q24	J-2	TP8	H-2
D52	F-3	Q25	I-4	TP9	H-2
D53	F-3	Q26	E-4	TP10	H-6
D601	L-4	Q27	J-5	TP12	J-3
D602	L-4	Q31	L-5	TP14	J-4
D701	G-3	Q32	L-1	TP15	K-3
		Q33	L-2	TP16	K-4
DL1	E-5	Q34	L-1	TP17	K-6
DL2	L-3	Q35	K-1	TP18	B-3
DL3	A-1	Q37	L-1	TP19	A-4
		Q38	L-2	TP20	D-2
E2	K-2	Q39	L-1	TP21	F-5
E3	K-3	Q401	C-6	TP22	G-6
E4	G-5	Q402	D-6	TP23	F-6
E5	B-2	Q403	D-7	TP24	J-6
E11	D-1	Q601	L-3	TP25	B-2
		Q602	L-4	TP26	B-5
FL1	A-1	Q701	H-3	TP27	K-1
FL2	D-5	Q702	H-3	TP28	G-5
FL3	H-6	Q703	J-1	TP30	F-6
FL4	L-5	Q704	K-5	TP31	K-3
		Q801	H-7	TP32	E-1
		Q802	I-7	TP33	L-2
				X1	D-3
				X2	A-2



CB-6 - SOLDERING SIDE -

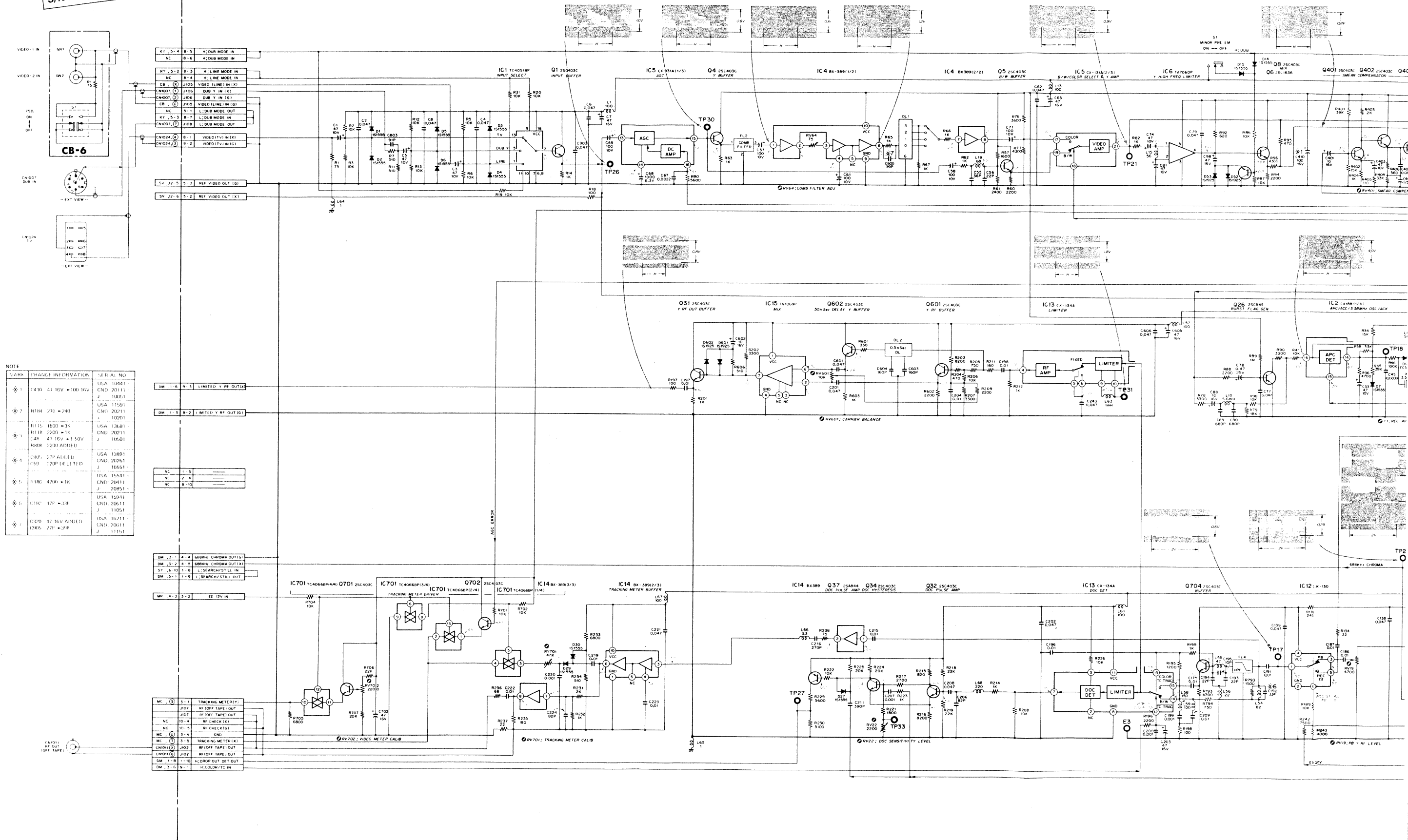




MP-12 - SOLDERING SIDE -

MP-12
(VIDEO MODULATOR)
CB-6

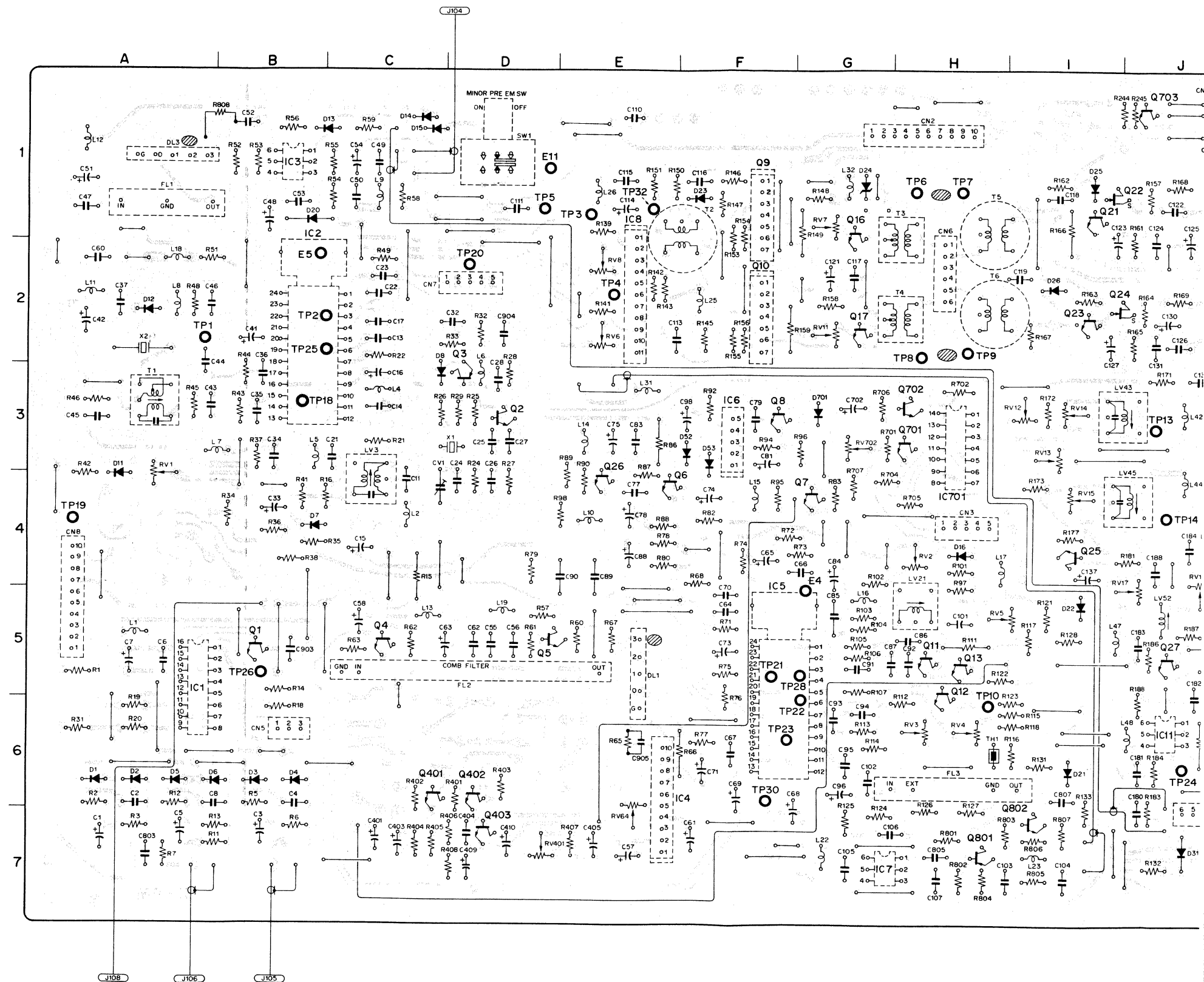
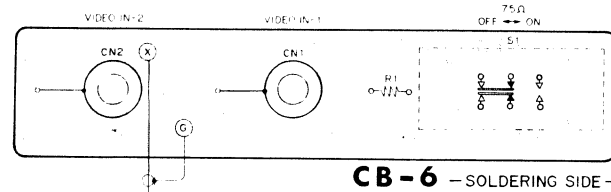
S/N 10441 AND LATER (USA)
S/N 20111 AND LATER (CND)

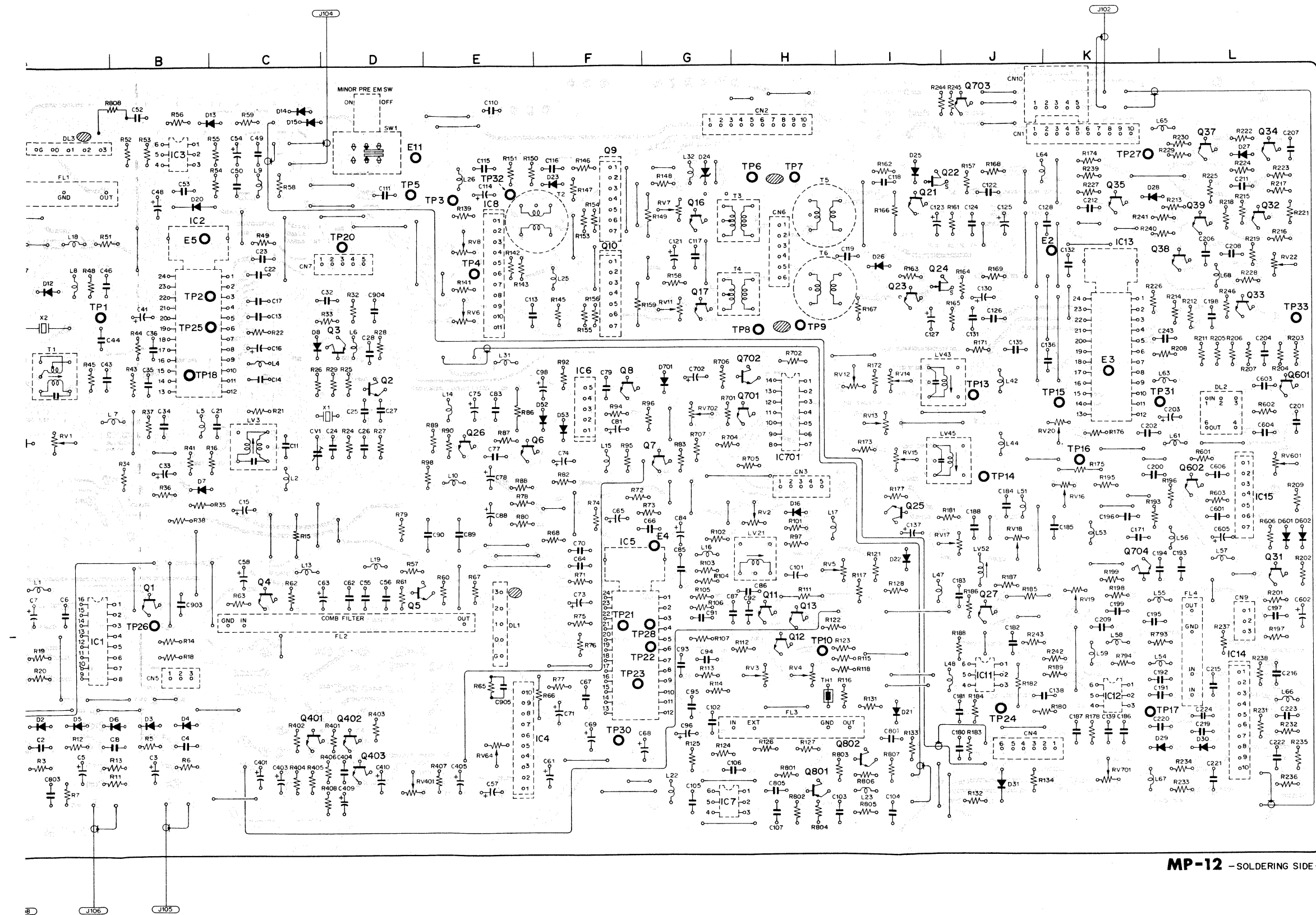




MP-12 (VIDEO MODULATOR)
CB-6S/N 13691 ~ 19310 (USA)
S/N 20211 ~ 20710 (CND)

CN1	K-1	IC1	A-5	RV1	A-4
CN2	H-1	IC2	B-2	RV2	H-4
CN3	H-4	IC3	B-1	RV3	H-6
CN4	J-7	IC4	E-6	RV4	H-6
CN5	B-6	IC5	F-5	RV5	H-5
CN6	H-2	IC6	F-3	RV6	E-2
CN7	D-2	IC7	G-7	RV7	G-1
CN8	A-5	IC8	E-2	RV8	E-2
CN9	L-5	IC9	F-1	RV11	G-2
CN10	K-1	IC10	F-2	RV12	I-3
CV1	C-4	IC11	J-6	RV13	I-3
D1	A-6	IC12	K-6	RV14	I-3
D2	A-6	IC13	K-3	RV15	I-4
D3	B-6	IC14	L-6	RV16	K-4
D4	B-6	IC15	L-4	RV17	J-5
D5	A-6	IC701	H-3	RV18	J-5
D6	A-6	L3	C-4	RV19	K-5
D7	B-4	L52	J-5	RV20	K-3
D8	C-3	LV21	H-5	RV22	L-2
D11	A-4	LV43	J-3	RV64	D-7
D12	A-2	LV44	J-4	RV601	L-4
D13	B-1			RV701	K-7
D14	C-1	O1	B-5	RV702	G-3
D15	C-1	Q2	D-3	SW1	D-1
D16	H-4	Q3	D-3	T1	A-3
D18	G-1	Q4	C-5	T2	E-1
D19	G-2	Q5	D-5	T3	H-1
D20	B-1	Q6	E-4	T4	H-2
D21	I-6	Q7	G-4	T5	H-1
D22	I-5	Q8	F-3	T6	H-2
D23	F-1	Q11	H-5	TP1	A-2
D24	G-1	Q12	H-6	TP2	B-2
D25	I-1	Q13	H-5	TP3	E-1
D26	I-2	Q16	G-1	TP4	E-2
D27	L-1	Q17	G-2	TP5	D-1
D28	K-1	Q21	I-1	TP6	H-1
D29	L-6	Q22	J-1	TP7	H-1
D30	L-6	Q23	I-2	TP8	H-2
D31	J-7	Q24	J-2	TP9	H-2
D52	F-3	Q25	I-4	TP10	H-6
D53	F-3	Q26	E-4	TP13	J-3
D601	L-4	Q27	J-5	TP14	J-4
D602	L-4	Q31	L-5	TP15	K-3
D701	G-3	Q32	L-1	TP16	K-4
DL1	E-5	Q33	L-2	TP17	K-6
DL2	L-3	Q34	L-1	TP18	B-3
DL3	A-1	Q35	K-1	TP19	A-4
E2	K-2	Q37	L-1	TP20	D-2
E3	K-3	Q38	L-2	TP21	F-5
E4	G-5	Q39	L-1	TP22	G-6
E5	B-2	Q401	C-6	TP23	F-6
E11	D-1	Q402	D-6	TP24	J-6
FL1	A-1	Q403	D-7	TP25	B-2
FL2	D-5	Q601	L-3	TP26	B-5
FL3	H-6	Q602	L-4	TP27	K-1
FL4	L-5	Q701	H-3	TP28	G-5
		Q702	H-3	TP30	F-6
		Q703	J-1	TP31	K-3
		Q704	K-5	TP32	E-1
		Q801	H-7	TP33	L-2
		Q802	I-7		
				X1	D-3
				X2	A-2



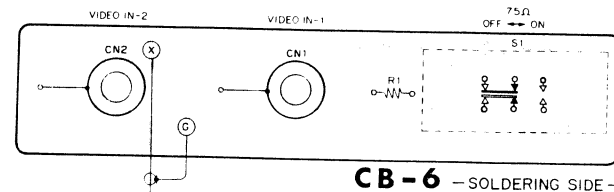


MP-12 (VIDEO MODULATOR)
CB-6

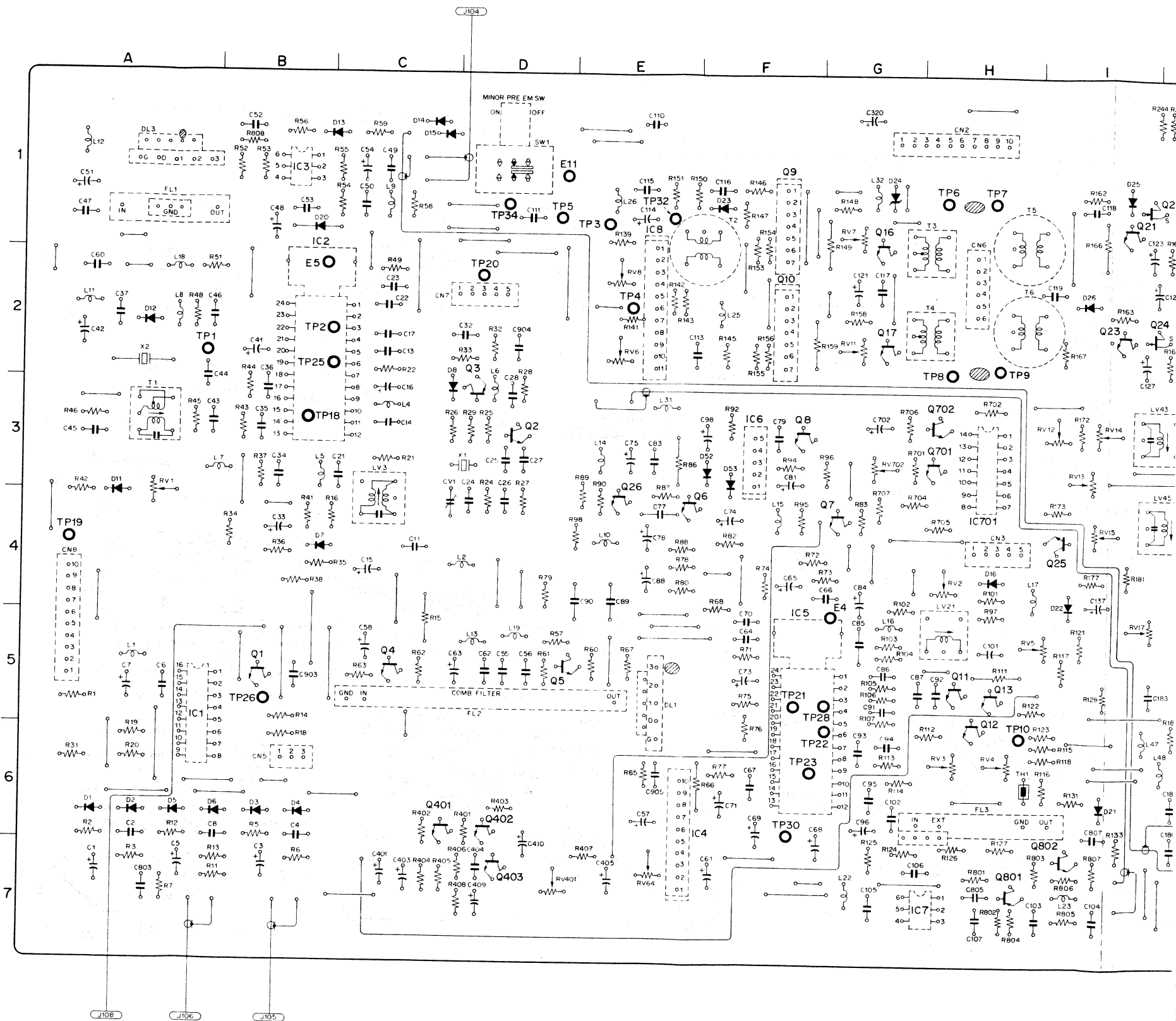
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S/N 20711 AND LATER (CND)

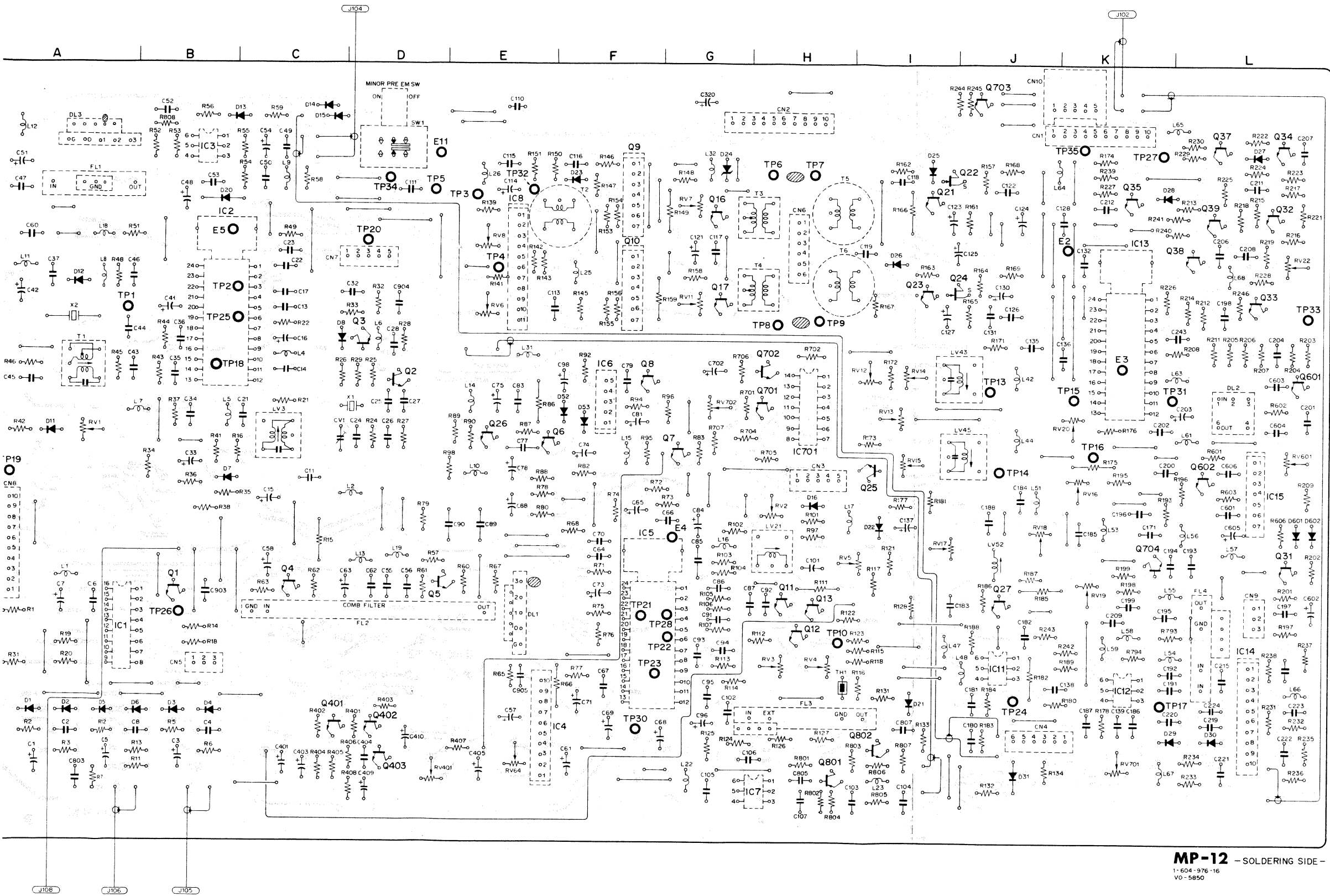
MP-12/CB-6 MP-12/CB-6

CN1 K-1	IC1 A-5	RV1 A-4
CN2 H-1	IC2 B-2	RV2 H-4
CN3 H-4	IC3 B-1	RV3 H-6
CN4 J-7	IC4 E-6	RV4 H-6
CN5 B-6	IC5 F-5	RV5 H-5
CN6 H-2	IC6 F-3	RV6 E-2
CN7 D-2	IC7 G-7	RV7 G-1
CN8 A-5	IC8 E-2	RV8 E-2
CN9 L-5	IC9 F-1	RV11 G-2
CN10 K-1	IC10 F-2	RV12 I-3
	IC11 J-6	RV13 I-3
CV1 C-4	IC12 K-6	RV14 I-3
	IC13 K-3	RV15 I-4
D1 A-6	IC14 L-6	RV16 K-4
D2 A-6	IC15 L-4	RV17 J-5
D3 B-6	IC701 H-3	RV18 J-5
D4 B-6		RV19 K-5
D5 A-6	LV21 H-5	RV20 K-3
D6 A-6	LV43 J-3	RV22 L-2
D7 B-4	LV45 J-4	RV64 E-7
D8 C-3		RV401 D-7
D11 A-4	O1 B-5	RV701 K-7
D12 A-2	Q2 D-3	RV702 G-3
D13 B-1	Q3 D-3	
D14 C-1	Q4 C-5	SW1 D-1
D15 C-1	Q5 D-5	
D16 H-4	Q6 E-4	T1 A-3
D18 G-1	Q7 G-4	T2 E-1
D19 G-2	Q8 F-3	T3 H-1
D20 B-1	Q11 H-5	T4 H-2
D21 I-6	Q12 H-6	T5 H-1
D22 I-4	Q13 H-5	T6 H-2
D23 F-1	Q16 G-1	
D24 G-1	Q17 G-2	TP1 A-2
D25 I-1	Q21 I-1	TP2 B-2
D26 I-2	Q22 J-1	TP3 E-1
D27 L-1	Q23 I-2	TP4 E-2
D28 K-1	Q24 J-2	TP5 D-1
D29 L-6	Q25 I-4	TP6 H-1
D30 L-6	Q26 E-4	TP7 H-1
D31 J-7	Q27 J-5	TP8 H-2
D52 F-3	Q31 L-5	TP9 H-2
D53 F-3	Q32 L-1	TP10 H-6
D601 L-4	Q33 L-2	TP13 J-3
D602 L-4	Q34 L-1	TP14 J-4
	Q35 K-1	TP15 K-3
DL1 E-5	Q37 L-1	TP16 K-4
DL2 L-3	Q38 L-2	TP17 K-6
DL3 A-1	Q39 L-1	TP18 B-3
	Q401 C-6	TP19 A-4
E2 K-2	Q402 D-6	TP20 D-2
E3 K-3	Q403 D-7	TP21 F-5
E4 G-5	Q601 L-3	TP22 G-6
E5 B-2	Q602 L-4	TP23 F-6
E11 D-1	Q701 H-3	TP24 J-6
	Q702 H-3	TP25 B-2
FL1 A-1	Q703 J-1	TP26 B-5
FL2 D-5	Q704 K-5	TP27 K-1
FL3 H-6	Q801 H-7	TP28 G-5
FL4 L-5	Q802 I-7	TP30 F-6
		TP31 K-3
		TP32 E-1
		TP33 L-2
		TP34 D-1
		TP35 K-1
		X1 D-3
		X2 A-2



CB-6 - SOLDERING SIDE -

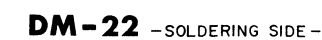




DM-22 (VIDEO DEMODULATOR)
DL-2

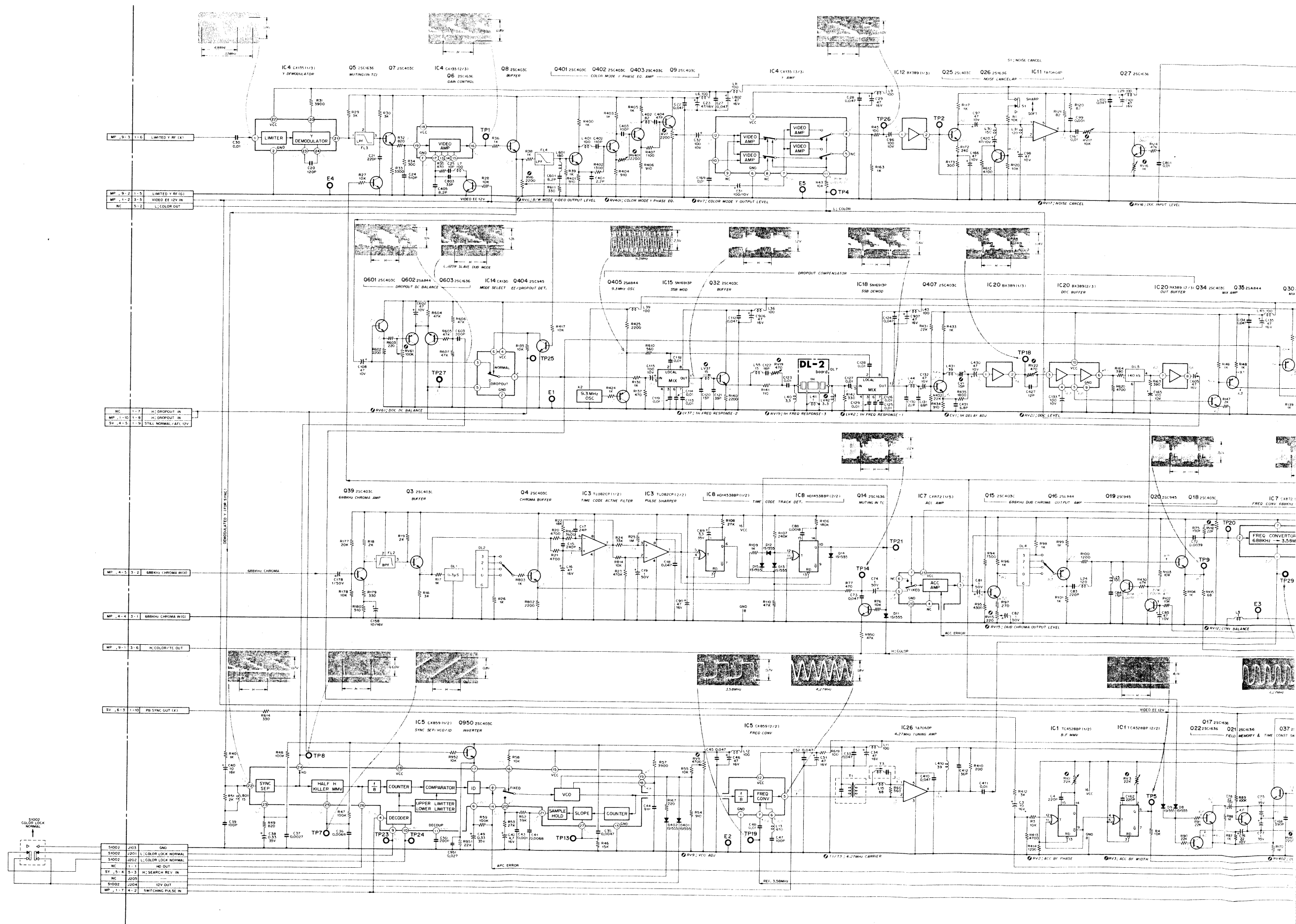
S/N UP TO 10140 (USA)
S/N UP TO 20010 (CND)

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CN2	L-7	FL3	B-2	Q24	M-4	RV401	A-4
CN3	L-4	FL4	A-3	Q25	B-5	RV402	I-4
CN4	F-1			Q26	C-5		
CN5	E-5			Q27	A-5	SW1	B-1
D1	G-2	IC1	D-1	Q28	A-7	T1	F-2
D2	G-2	IC2	E-2	Q30	C-7	T2	G-4
D3	G-2	IC3	K-2	Q31	F-7	T3	F-3
D4	G-1	IC4	C-3	Q32	E-6		
D5	F-1	IC5	E-3	Q33	M-7		
D6	L-4	IC6	G-3	Q34	L-6	TP1	B-3
D7	L-4	IC7	H-4	Q35	L-7	TP2	B-5
D8	K-4	IC8	L-2	Q36	J-2	TP3	B-6
D9	L-5	IC9	M-3	Q37	J-4	TP4	D-4
D10	K-4	IC10	A-6	Q38	G-2	TP5	D-2
D11	K-3	IC11	C-5	Q39	J-2	TP6	F-7
D12	L-2	IC12	A-6	Q401	B-4	TP7	E-3
D13	L-2	IC13	D-7	Q402	B-4	TP8	D-3
D14	M-2	IC14	H-7	Q403	A-4	TP9	L-3
D15	M-2	IC15	J-7	Q404	B-6	TP10	M-6
D16	M-2	IC16	I-6	Q405	G-7	TP11	I-7
D17	E-7	IC17	K-6	Q406	I-6	TP12	H-3
D18	E-7	IC18	M-5	Q407	K-6	TP13	D-3
D19	H-5	IC19	B-6	Q408	C-7	TP14	I-4
D20	L-6	IC20	H-1	Q409	J-4	TP15	F-2
D21	L-7	IC21	G-6	Q410	K-6	TP16	F-5
D22	F-6	IC22	E-6	Q411	K-6	TP17	K-6
D23	L-6	IC23	G-6	Q412	K-6	TP18	H-5
D24	F-5	IC24	G-2	Q413	K-6	TP19	H-5
D25	E-5	IC25	G-3	Q414	K-6	TP20	I-3
D26	H-6	IC26	I-1	Q415	K-6	TP21	K-3
D27	H-6	IC27	I-1	Q416	K-6	TP22	K-5
D28	H-6	IC28	I-1	Q417	K-6	TP23	F-4
D29	H-6	IC29	I-1	Q418	K-6	TP24	F-4
D30	H-6	IC30	I-1	Q419	K-6	TP25	D-2
D31	H-6	IC31	I-1	Q420	K-6	TP26	B-5
D32	H-6	IC32	I-1	Q421	K-6	TP27	C-6
D33	H-6	IC33	I-1	Q422	K-6	TP28	G-3
D34	H-6	IC34	I-1	Q423	K-6	TP29	H-3
D35	H-6	IC35	I-1	Q424	K-6	TP30	B-7
D36	H-6	IC36	I-1	Q425	K-6		
D37	H-6	IC37	I-1	Q426	K-6		
D38	H-6	IC38	I-1	Q427	K-6		
D39	H-6	IC39	I-1	Q428	K-6		
D40	H-6	IC40	I-1	Q429	K-6		
D41	H-6	IC41	I-1	Q430	K-6		
D42	H-6	IC42	I-1	Q431	K-6		
D43	H-6	IC43	I-1	Q432	K-6		
D44	H-6	IC44	I-1	Q433	K-6		
D45	H-6	IC45	I-1	Q434	K-6		
D46	H-6	IC46	I-1	Q435	K-6		
D47	H-6	IC47	I-1	Q436	K-6		
D48	H-6	IC48	I-1	Q437	K-6		
D49	H-6	IC49	I-1	Q438	K-6		
D50	H-6	IC50	I-1	Q439	K-6		
D51	H-6	IC51	I-1	Q440	K-6		
D52	H-6	IC52	I-1	Q441	K-6		
D53	H-6	IC53	I-1	Q442	K-6		
D54	H-6	IC54	I-1	Q443	K-6		
D55	H-6	IC55	I-1	Q444	K-6		
D56	H-6	IC56	I-1	Q445	K-6		
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D58	H-6	IC58	I-1	Q447	K-6		
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D60	H-6	IC60	I-1	Q449	K-6		
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D62	H-6	IC62	I-1	Q451	K-6		
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D70	H-6	IC70	I-1	Q459	K-6		
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D72	H-6	IC72	I-1	Q461	K-6		
D73	H-6	IC73	I-1	Q462	K-6		
D74	H-6	IC74	I-1	Q463	K-6		
D75	H-6	IC75	I-1	Q464	K-6		
D76	H-6	IC76	I-1	Q465	K-6		
D77	H-6	IC77	I-1	Q466	K-6		
D78	H-6	IC78	I-1	Q467	K-6		
D79	H-6	IC79	I-1	Q468	K-6		
D80	H-6	IC80	I-1	Q469	K-6		
D81	H-6	IC81	I-1	Q470	K-6		
D82	H-6	IC82	I-1	Q471	K-6		
D83	H-6	IC83	I-1	Q472	K-6		
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D86	H-6	IC86	I-1	Q475	K-6		
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D88	H-6	IC88	I-1	Q477	K-6		
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D92	H-6	IC92	I-1	Q481	K-6		
D93	H-6	IC93	I-1	Q482	K-6		
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D95	H-6	IC95	I-1	Q484	K-6		
D96	H-6	IC96	I-1	Q485	K-6		
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D98	H-6	IC98	I-1	Q487	K-6		
D99	H-6	IC99	I-1	Q488	K-6		
D100	H-6	IC100	I-1	Q489	K-6		
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D119	H-6	IC119	I-1	Q508	K-6		
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D121	H-6	IC121	I-1	Q510	K-6		
D122	H-6	IC122	I-1	Q511	K-6		
D123	H-6	IC123	I-1	Q512	K-6		
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D125	H-6	IC125	I-1	Q514	K-6		
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D145	H-6	IC145	I-1	Q534	K-6		
D146	H-6	IC146	I-1	Q535	K-6		
D147	H-6	IC147	I-1	Q536	K-6		
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D149	H-6	IC149	I-1	Q538	K-6		
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D152	H-6	IC152	I-1	Q541	K-6		
D153	H-6	IC153	I-1	Q542	K-6		
D154	H-6	IC154	I-1	Q543	K-6		
D155	H-6	IC155	I-1	Q544	K-6		
D156	H-6	IC156	I-1	Q545	K-6		
D157	H-6	IC157	I-1	Q546	K-6		
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D159	H-6	IC159	I-1	Q548	K-6		
D160	H-6	IC160	I-1	Q549	K-6		
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D162	H-6	IC162	I-1	Q551	K-6		
D163	H-6	IC163	I-1	Q552	K-6		
D164	H-6	IC164	I-1	Q553	K-6		
D165	H-6	IC165	I-1	Q554	K-6		
D166	H-6	IC166	I-1	Q555	K-6		
D167	H-6	IC167	I-1	Q556	K-6		
D168	H-6	IC168	I-1	Q557	K-6		
D169	H-6	IC169	I-1	Q558	K-6		
D170	H-6	IC170	I-1	Q559	K-6		
D171	H-6	IC171	I-1	Q560	K-6		
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D175	H-6	IC175	I-1	Q564	K-6		
D176	H-6	IC176	I-1	Q565	K-6		
D177	H-6	IC177	I-1	Q566	K-6		
D178	H-6	IC178	I-1	Q567	K-6		
D179	H-6	IC179	I-1	Q568	K-6		
D180	H-6	IC180	I-1	Q569	K-6		
D181	H-6	IC181	I-1	Q570	K-6		
D182	H-6	IC182	I-1	Q571	K-6		
D183	H-6	IC183	I-1	Q572	K-6		
D184	H-6	IC184	I-1	Q573	K-6		
D185	H-6	IC185	I-1	Q574	K-6		
D186	H-6	IC186	I-1	Q575	K-6		
D187	H-6	IC187	I-1	Q576	K-6		
D188	H-6	IC188	I-1	Q577	K-6		
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D193	H-6	IC193	I-1	Q582	K-6		
D194	H-6	IC194	I-1	Q583	K-6		
D195	H-6	IC195	I-1	Q584	K-6		
D196	H-6	IC196	I-1	Q585	K-6		
D197	H-6	IC197	I-1	Q586	K-6		
D198	H-6	IC198	I-1	Q587	K-6		
D199	H-6	IC199	I-1	Q588	K-6		
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DM-22/DL-2

S/N UP TO 10140 (USA)
S/N UP TO 20010 (CND)



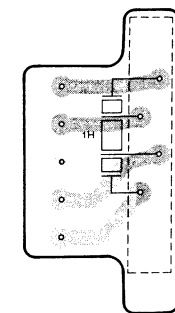


DM-22/DL-2

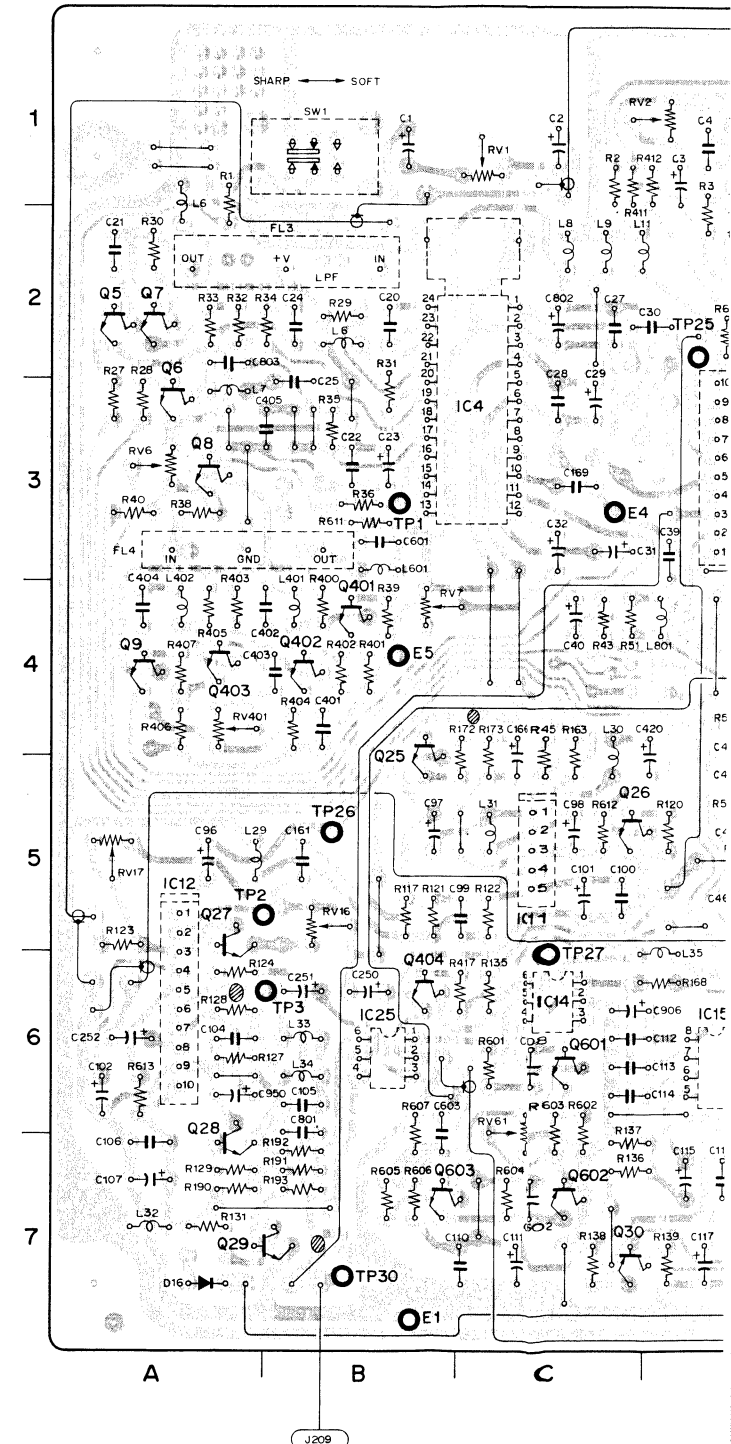
DM-22 (VIDEO DEMODULATOR)
DL-2

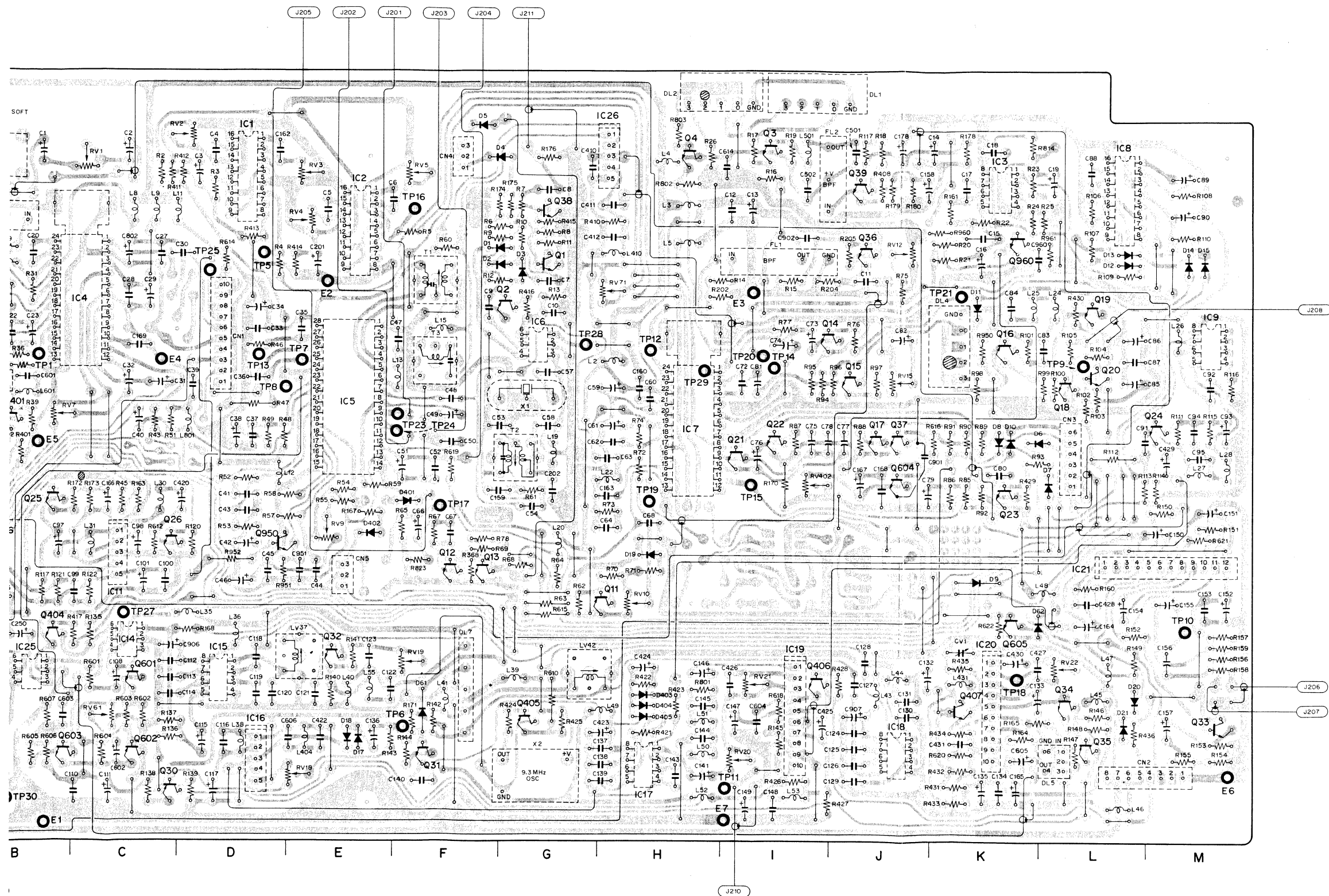
S/N 10141 ~ 10440 (USA)
S/N 20011 ~ 20110 (CND)

CV1	K-6	FL1	I-2	Q22	I-4	RV61	C-7
CN1	D-3	FL2	J-1	Q23	K-4	RV71	H-3
CN2	L-7	FL3	B-2	Q24	M-4	RV401	A-4
CN3	L-4	FL4	A-3	Q25	B-5	RV402	I-4
CN4	F-1			Q26	C-5		
CN5	E-5	IC1	D-1	Q27	A-5	SW1	B-1
		IC2	E-2	Q28	A-7		
D1	G-2	IC3	K-2	Q30	C-7	T1	F-2
D2	G-2	IC4	C-3	Q31	F-7	T2	G-4
D3	G-2	IC5	E-3	Q32	E-6	T3	F-3
D4	G-1	IC6	G-3	Q33	M-7		
D5	F-1	IC7	H-4	Q34	L-6	TP1	B-3
D6	L-4	IC8	L-2	Q35	L-7	TP2	B-5
D7	L-4	IC9	M-3	Q36	J-2	TP3	B-6
D8	K-4	IC10	C-5	Q37	J-4	TP4	D-4
D9	L-5	IC11	C-6	Q38	G-2	TP5	D-2
D10	K-4	IC12	A-6	Q39	J-2	TP6	F-7
D11	K-3	IC13	D-7	Q401	B-4	TP7	E-3
D12	L-2	IC14	H-7	Q402	B-4	TP8	D-3
D13	L-2	IC15	J-7	Q403	A-4	TP9	L-3
D14	M-2	IC16	I-6	Q404	B-6	TP10	M-6
D15	M-2	IC17	K-6	Q405	G-7	TP11	I-7
D17	E-7	IC18	M-5	Q406	I-6	TP12	H-3
D18	E-7	IC19	B-6	Q407	K-6	TP13	D-3
D19	H-6	IC20	H-1	Q408	C-6	TP14	I-3
D20	L-6	IC21	E-6	Q409	C-7	TP15	I-4
D21	L-7	IC22	E-6	Q410	J-4	TP16	F-2
D61	F-6	LV37	G-6	Q411	K-6	TP17	F-5
D62	L-6	LV42	G-6	Q412	K-6	TP18	K-6
D401	F-5			Q413	H-5	TP19	H-5
D402	E-5	Q1	G-2	Q414	I-3	TP20	I-3
D403	H-6	Q2	G-3	Q415	K-3	TP21	K-3
D404	H-6	Q3	I-1	Q416	D-1	TP22	K-5
D405	H-7	Q4	H-1	Q417	E-1	TP23	F-4
DL1	I-1	Q5	A-2	Q418	E-2	TP24	F-4
DL2	I-1	Q6	A-3	Q419	F-1	TP25	D-2
DL4	K-3	Q7	A-2	Q420	A-3	TP26	B-5
DL5	L-7	Q8	A-3	Q421	B-4	TP27	C-6
E1	B-7	Q9	A-4	Q422	E-5	TP28	G-3
E2	E-2	Q10	H-5	Q423	H-5	TP29	H-3
E3	I-3	Q11	F-5	Q424	J-2	TP30	B-7
E4	C-3	Q12	F-5	Q425	J-3		
E5	B-4	Q13	J-3	Q426	B-5	X1	G-3
E6	M-7	Q14	J-3	Q427	A-5	X2	G-7
E7	I-7	Q15	J-3	Q428	E-7		
E8	E-5	Q16	K-3	Q429	F-6		
		Q17	J-4	Q430	I-7		
		Q18	L-3	Q431	I-6		
		Q19	L-3	Q432	L-6		
		Q20	L-3				
		Q21	I-4				



DL-2
-SOLDERING SIDE-





DM-22 - SOLDERING SIDE -

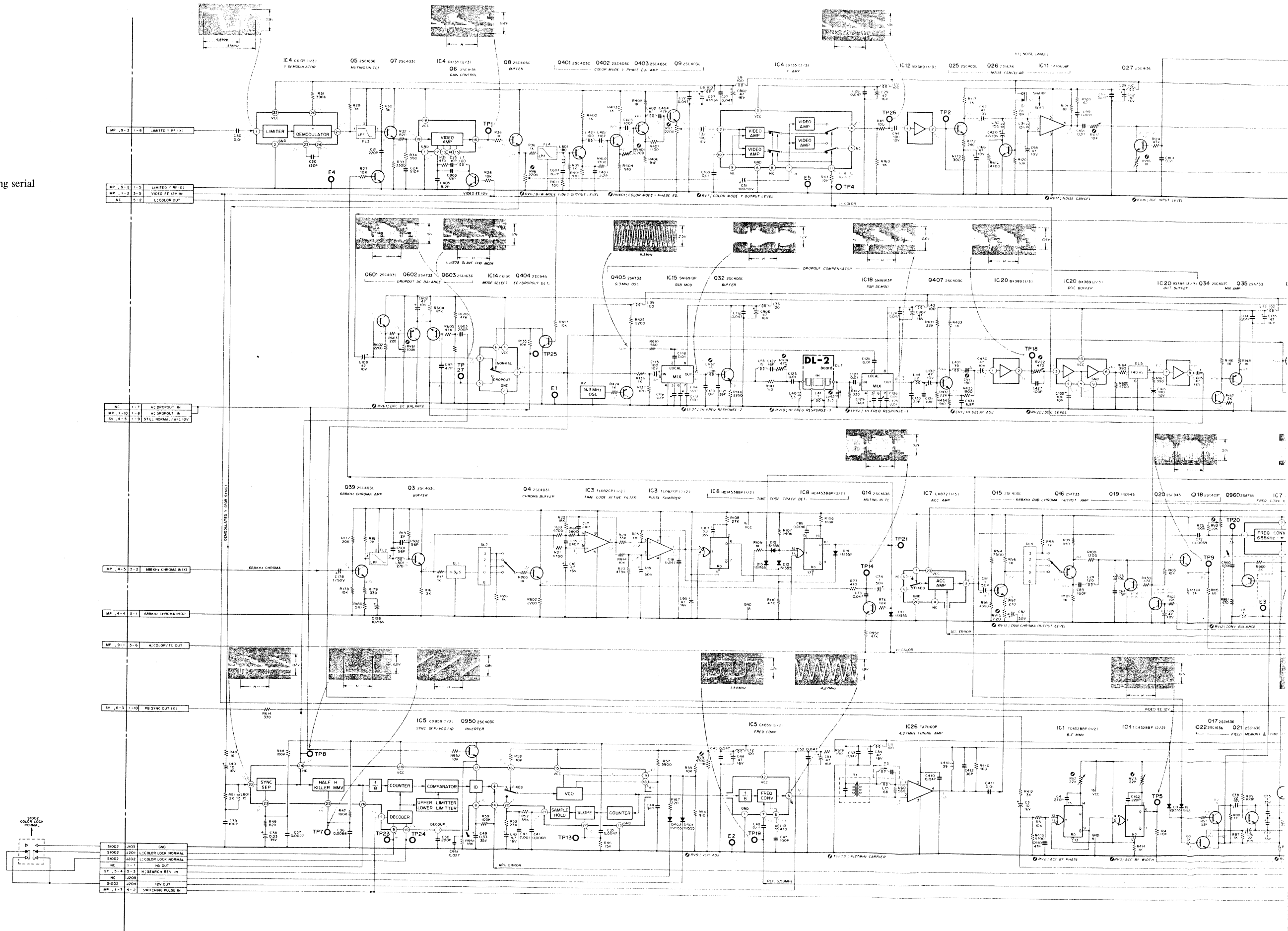
DM-22 (VIDEO DEMODULATOR)
DL-2

S/N 10141 ~ 10440 (USA)
S/N 20011 ~ 20110 (CND)

NOTE

→ Marked circuits are changed as the following serial number.

USA : 10141 and later
CND : 20011 and later



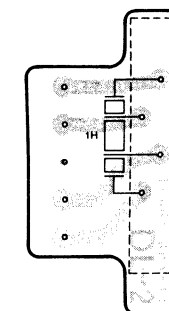


DM-22/DL-2

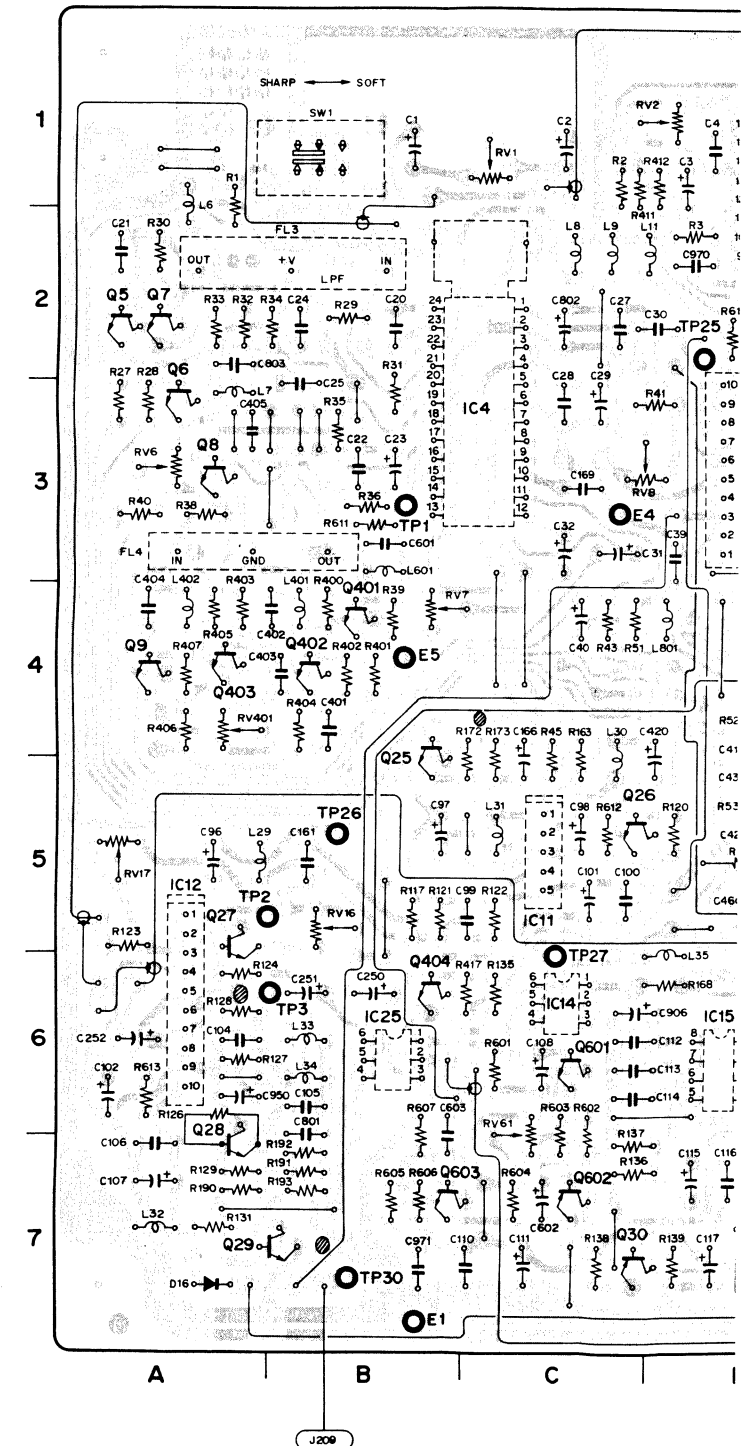
DM-22 (VIDEO DEMODULATOR)
DL-2

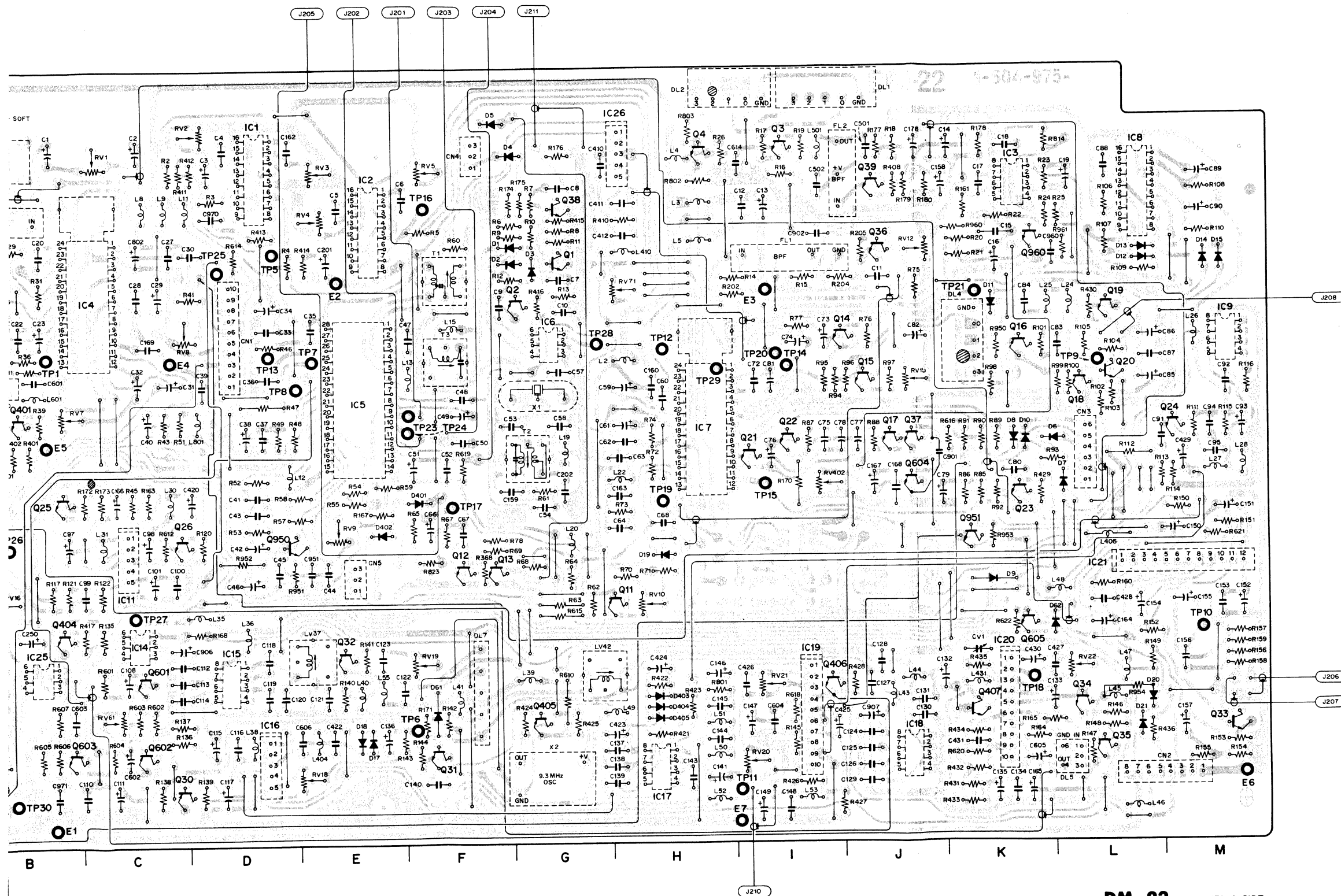
S/N 10441 ~ 13690 (USA)
S/N 20111 ~ 20210 (CND)

CV1	K-6	FL1	I-2	Q22	I-4	RV61	C-7
CN1	D-3	FL2	J-1	Q23	K-4	RV71	H-3
CN2	L-7	FL3	B-2	Q24	M-4	RV401	A-4
CN3	L-4	FL4	A-3	Q25	B-5	RV402	I-4
CN4	F-1	IC1	D-1	Q26	C-5	SW1	B-1
CN5	E-5	IC2	E-2	Q27	A-5	T1	F-2
D1	G-2	IC3	K-2	Q28	A-7	T2	G-4
D2	G-2	IC4	C-3	Q30	C-7	T3	F-3
D3	G-2	IC5	E-3	Q31	F-7	TP1	B-3
D4	G-1	IC6	G-3	Q32	E-6	TP2	B-5
D5	F-1	IC7	H-4	Q33	M-7	TP3	B-6
D6	L-4	IC8	L-2	Q34	L-6	TP4	D-4
D7	L-4	IC9	M-3	Q35	L-7	TP5	D-2
D8	K-4	IC10	C-5	Q36	J-2	TP6	F-7
D9	L-5	IC11	C-5	Q37	J-4	TP7	E-3
D10	K-4	IC12	A-6	Q38	G-2	TP8	D-3
D11	K-3	IC13	C-6	Q39	J-2	TP9	L-3
D12	L-2	IC14	D-6	Q40	B-4	TP10	M-6
D13	L-2	IC15	D-7	Q41	B-4	TP11	I-7
D14	M-2	IC16	H-7	Q42	B-4	TP12	H-3
D15	M-2	IC17	I-6	Q43	A-4	TP13	D-3
D16	E-7	IC18	J-7	Q44	B-6	TP14	I-3
D17	E-7	IC19	I-6	Q45	G-7	TP15	I-4
D18	E-7	IC20	K-6	Q46	I-6	TP16	F-2
D19	H-5	IC21	M-5	Q47	K-6	TP17	F-5
D20	L-6	IC22	B-6	Q48	K-6	TP18	K-6
D21	L-7	IC23	H-1	Q49	J-4	TP19	H-5
D22	L-7	IC24	G-6	Q50	D-5	TP20	I-3
D23	L-6	IC25	G-6	Q51	K-5	TP21	K-3
D24	F-5	Q1	G-2	RV1	C-1	TP22	K-6
D25	E-5	Q2	G-3	RV2	D-1	TP23	F-4
D26	H-6	Q3	I-1	RV3	E-1	TP24	F-4
D27	H-6	Q4	H-1	RV4	E-2	TP25	D-2
D28	H-7	Q5	A-2	RV5	F-1	TP26	B-5
DL1	I-1	Q6	A-3	RV6	A-3	TP27	C-6
DL2	I-1	Q7	A-2	RV7	B-4	TP28	G-3
DL3	K-3	Q8	A-3	RV8	C-3	TP29	H-3
DL4	L-7	Q9	A-4	RV9	E-5	TP30	B-7
DL5	L-7	Q10	H-5	RV10	H-5	X1	G-3
DL6	F-6	Q11	F-5	RV11	J-2	X2	G-7
E1	B-7	Q12	F-5	RV12	J-2		
E2	E-2	Q13	F-5	RV13	J-3		
E3	I-3	Q14	J-3	RV14	B-5		
E4	C-3	Q15	J-3	RV15	A-5		
E5	B-4	Q16	K-3	RV16	E-7		
E6	M-7	Q17	J-4	RV17	F-6		
E7	I-7	Q18	L-3	RV18	I-7		
E8	E-5	Q19	L-3	RV19	I-6		
		Q20	L-3	RV20	L-6		
		Q21	I-4	RV21			
				RV22			



DL-2
-SOLDERING SIDE-

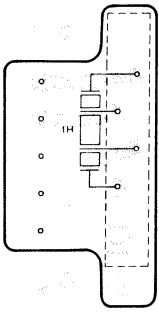




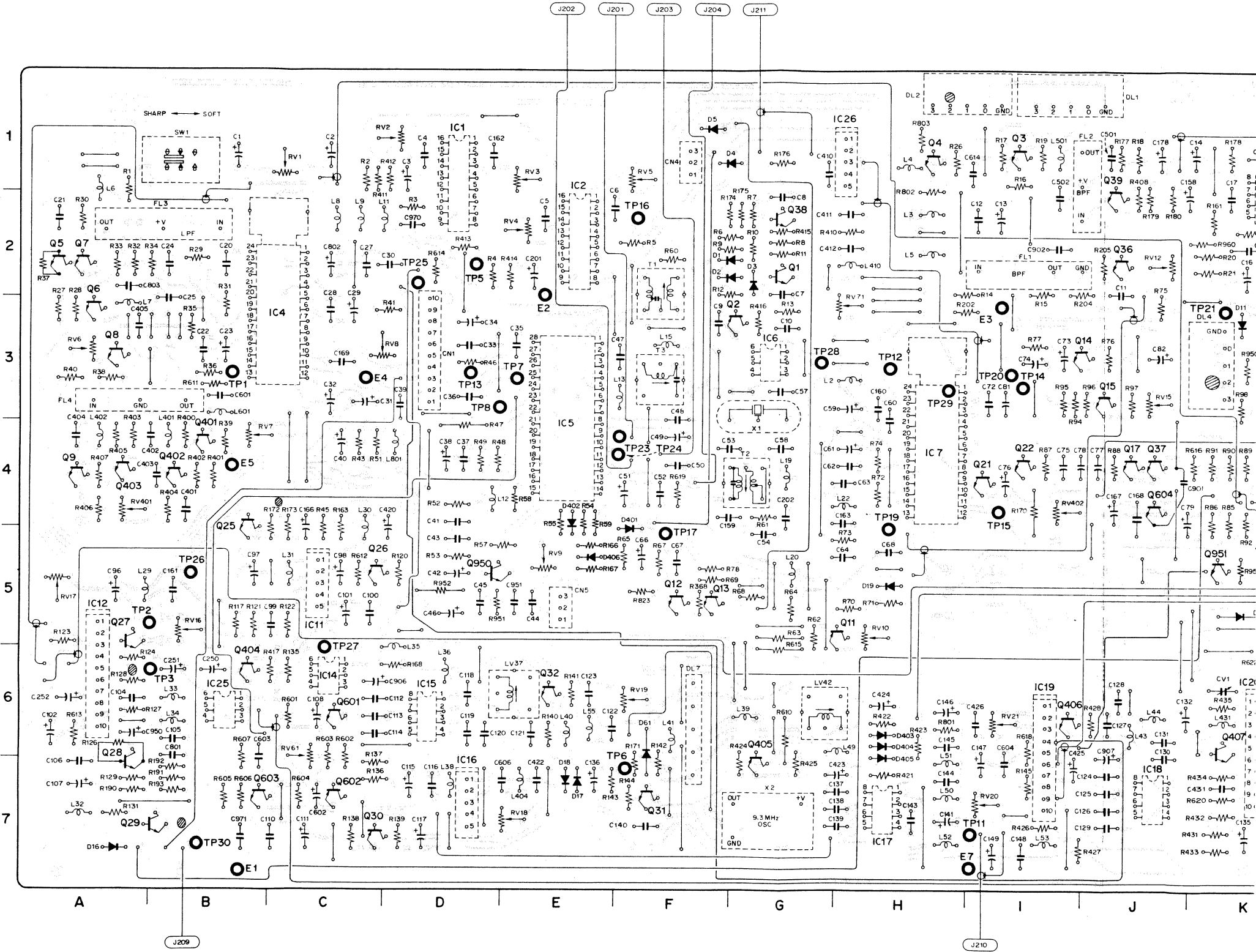
DM-22 (VIDEO DEMODULATOR)
DL-2

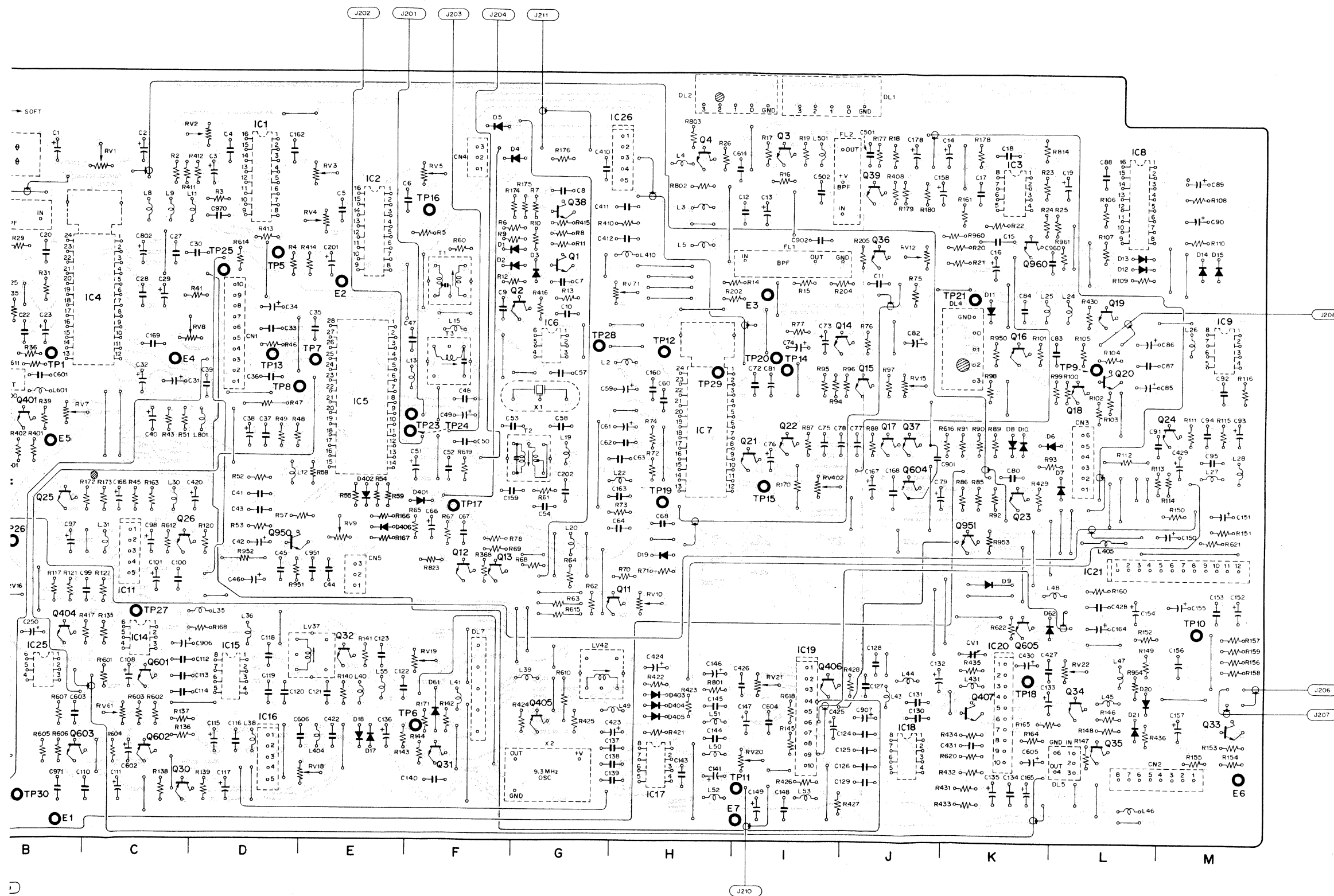
S/N 13691 ~ 19310 (USA)
S/N 20211 ~ 20710 (CND)

CV1	K-6	FL1	I-2	Q22	I-4	RV61	C-7
CN1	D-3	FL2	J-1	Q23	K-4	RV71	H-3
CN2	L-7	FL3	B-2	Q24	M-4	RV401	A-4
CN3	L-4	FL4	A-3	Q25	B-5	RV402	I-4
CN4	F-1	IC1	D-1	Q27	A-5	SW1	B-1
CN5	E-5	IC2	E-2	Q28	A-7		
		IC3	K-2	Q30	C-7	T1	F-2
D1	G-2	IC4	C-3	Q31	F-7	T2	G-4
D2	G-2	IC5	E-3	Q32	E-6	T3	F-3
D3	G-2	IC6	G-3	Q33	M-7		
D4	G-1	IC7	H-4	Q34	L-6	TP1	B-3
D5	F-1	IC8	L-2	Q35	L-7	TP2	B-5
D6	L-4	IC9	M-3	Q36	J-2	TP3	B-6
D7	L-4	IC11	C-5	Q37	J-4	TP4	D-4
D8	K-4	IC12	A-6	Q38	G-2	TP5	D-2
D9	L-5	IC14	C-6	Q39	J-2	TP6	F-7
D10	K-4	IC15	D-6	Q401	B-4	TP7	E-3
D11	K-3	IC16	D-7	Q402	B-4	TP8	D-3
D12	L-2	IC17	H-7	Q403	A-4	TP9	L-3
D13	L-2	IC18	J-7	Q404	B-6	TP10	M-6
D14	M-2	IC19	I-6	Q405	G-7	TP11	I-7
D15	M-2	IC20	K-6	Q406	I-6	TP12	H-3
D17	E-7	IC21	M-5	Q407	K-6	TP13	D-3
D18	E-7	IC25	B-6	Q601	C-6	TP14	I-3
D19	H-5	IC26	H-1	Q602	C-7	TP15	I-4
D20	L-6			Q603	B-7	TP16	F-2
D21	L-7	LV37	E-6	Q604	J-4	TP17	F-5
D61	F-6	LV42	G-6	Q605	K-6	TP18	K-6
D62	L-6			Q950	D-5	TP19	H-5
D401	F-5	Q1	G-2	RV1	C-1	TP20	I-3
D402	E-5	Q2	G-3	RV2	D-1	TP21	K-3
D403	H-6	Q3	I-1	RV3	E-1	TP22	K-5
D404	H-6	Q4	H-1	RV4	E-2	TP23	F-4
D405	H-7	Q5	A-2	RV5	F-1	TP25	D-2
DL1	I-1	Q6	A-3	RV6	A-3	TP26	B-5
DL2	I-1	Q8	A-3	RV7	B-4	TP27	C-6
DL4	K-3	Q9	A-4	RV9	E-5	TP28	G-3
DL5	L-7	Q11	H-5	RV10	H-5	TP29	H-3
DL7	F-6	Q12	F-5	RV12	J-2	TP30	B-7
		Q13	F-5	RV15	J-3		
E1	B-7	Q14	J-3	RV16	B-5	X1	G-3
E2	E-2	Q15	J-3	RV17	A-5	X2	G-7
E3	I-3	Q16	K-3	RV18	E-7		
E4	C-3	Q17	J-4	RV19	F-6		
E5	B-4	Q18	L-3	RV20	I-7		
E6	M-7	Q19	L-3	RV21	I-6		
E7	I-7	Q20	L-3	RV22	L-6		
E8	E-5	Q21	I-4				



DL-2
-SOLDERING SIDE-

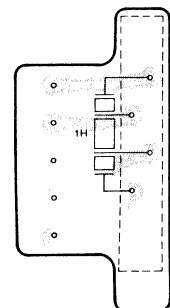




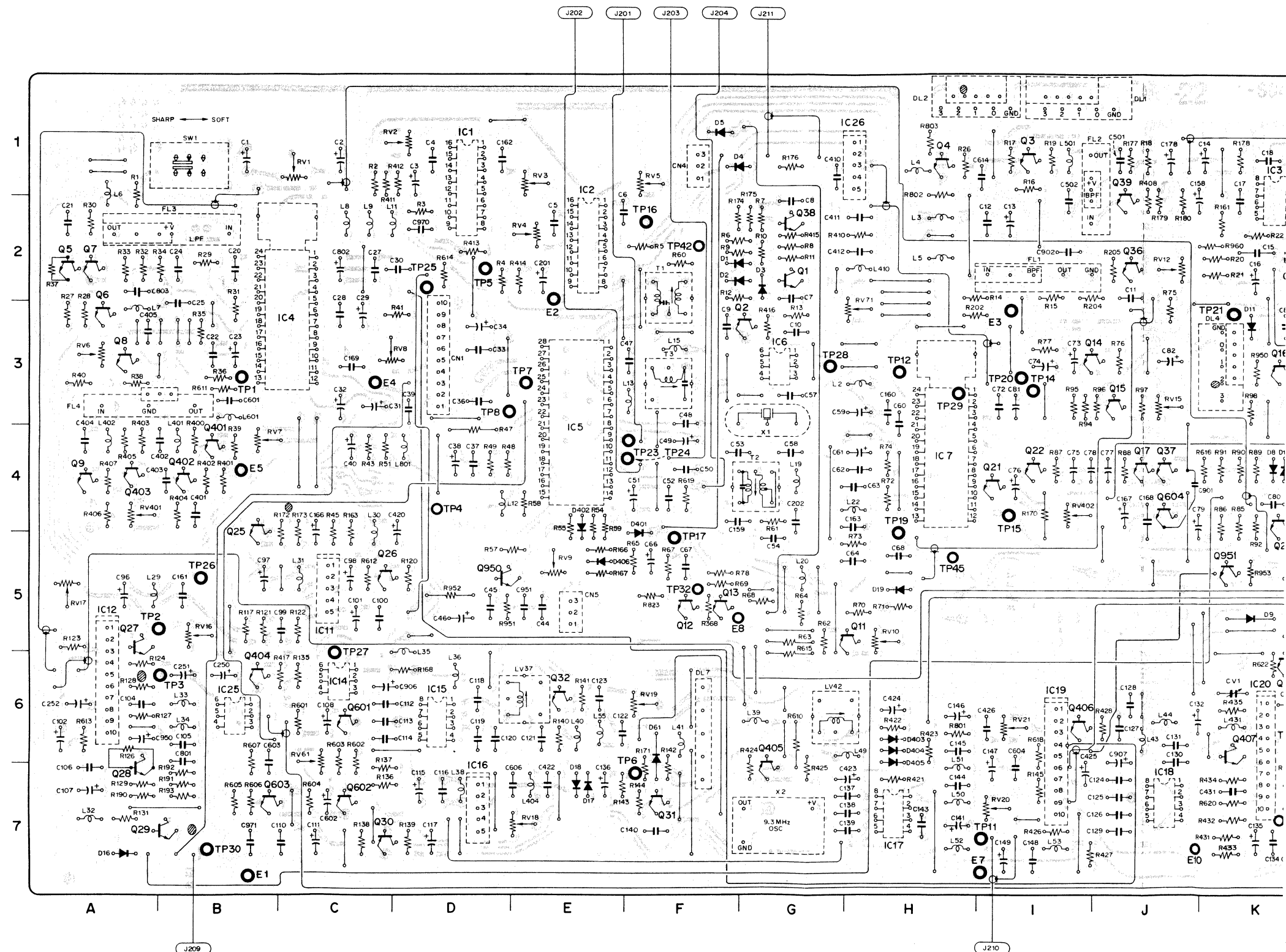
DM-22 - SOLDERING SIDE -

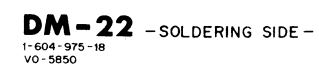
S/N 19311 AND LATER (USA)
S/N 20711 AND LATER (CND)

CV1	K - 6	FL1	I - 2	Q22	I - 4	RV61	C - 7
		FL2	J - 1	Q23	K - 4	RV71	H - 3
CN1	D - 3	FL3	B - 2	Q24	M - 4	RV401	A - 4
CN2	L - 7	FL4	A - 3	Q25	B - 5	RV402	I - 4
CN3	L - 4			Q26	C - 5		
CN4	F - 1	IC1	D - 1	Q27	A - 5	SW1	B - 1
CN5	E - 5	IC2	E - 2	Q28	A - 7		
		IC3	K - 2	Q30	C - 7	T1	F - 2
D1	G - 2	IC4	E - 3	Q31	F - 7	T2	G - 4
D2	G - 2	IC5	E - 3	Q32	E - 6	T3	F - 3
D3	G - 3	IC6	G - 3	Q33	M - 7		
D4	G - 1	IC7	H - 4	Q34	L - 6	TP1	B - 5
D5	F - 1	IC8	L - 2	Q35	L - 7	TP2	B - 3
D6	L - 4	IC9	M - 3	Q36	J - 2	TP3	B - 6
D7	L - 4	IC11	C - 5	Q37	J - 4	TP4	D - 4
D8	K - 4	IC12	A - 6	Q38	G - 2	TP5	D - 2
D9	L - 5	IC14	C - 6	Q39	J - 2	TP6	F - 7
D10	K - 4	IC15	D - 6	Q401	B - 4	TP7	E - 3
D11	K - 3	IC16	D - 7	Q402	B - 4	TP8	E - 3
D12	L - 2	IC17	H - 7	Q403	A - 4	TP9	M - 6
D13	L - 2	IC18	J - 7	Q404	B - 6	TP10	M - 6
D14	M - 2	IC19	I - 6	Q405	G - 7	TP11	I - 7
D15	M - 2	IC20	K - 6	Q406	I - 6	TP12	H - 3
D16	A - 7	IC21	M - 5	Q407	K - 6	TP14	I - 3
D17	E - 7	IC25	B - 6	Q601	C - 6	TP15	I - 4
D18	E - 7	IC26	H - 1	Q602	C - 7	TP16	F - 1
D19	H - 5			Q603	B - 7	TP17	F - 5
D20	L - 6	LV37	E - 6	Q604	J - 4	TP18	K - 6
D21	L - 7	LV42	G - 6	Q605	K - 6	TP19	H - 5
D61	F - 6			Q950	D - 5	TP20	I - 3
D62	L - 6	Q1	G - 2			TP21	K - 3
D401	F - 5	Q2	G - 3	RV1	C - 1	TP23	F - 4
D402	E - 5	Q3	I - 1	RV2	D - 1	TP24	F - 4
D403	H - 6	Q4	H - 1	RV3	E - 1	TP25	D - 2
D404	H - 6	Q5	A - 2	RV4	E - 2	TP26	B - 5
D405	H - 7	Q6	A - 3	RV5	F - 1	TP27	C - 6
D406	E - 5	Q7	A - 2	RV6	A - 3	TP28	G - 3
		Q8	A - 3	RV7	B - 4	TP29	H - 3
		Q9	A - 4	RV9	E - 5	TP30	B - 7
DL1	I - 1	Q11	H - 5	RV10	H - 5	TP32	G - 5
DL2	I - 1	Q12	F - 5	RV12	J - 2	TP41	K - 7
DL4	K - 3	Q13	F - 5	RV15	J - 3	TP42	F - 2
DL5	L - 7	Q14	J - 3	RV16	B - 5	TP45	I - 5
DL7	F - 6	Q15	J - 3	RV17	A - 5	TP46	M - 7
		Q16	K - 3	RV18	E - 7		
E1	B - 7	Q17	J - 4	RV19	F - 6	X1	G - 3
E2	I - 3	Q18	L - 3	RV20	I - 7	X2	G - 7
E3	D - 3	Q19	L - 3	RV21	I - 6		
E5	B - 4	Q20	L - 3	RV22	L - 6		
E6	M - 7	Q21	I - 4				
E7	I - 7						
E8	G - 5						
E10	K - 7						



DL-2
-SOLDERING SIDE-



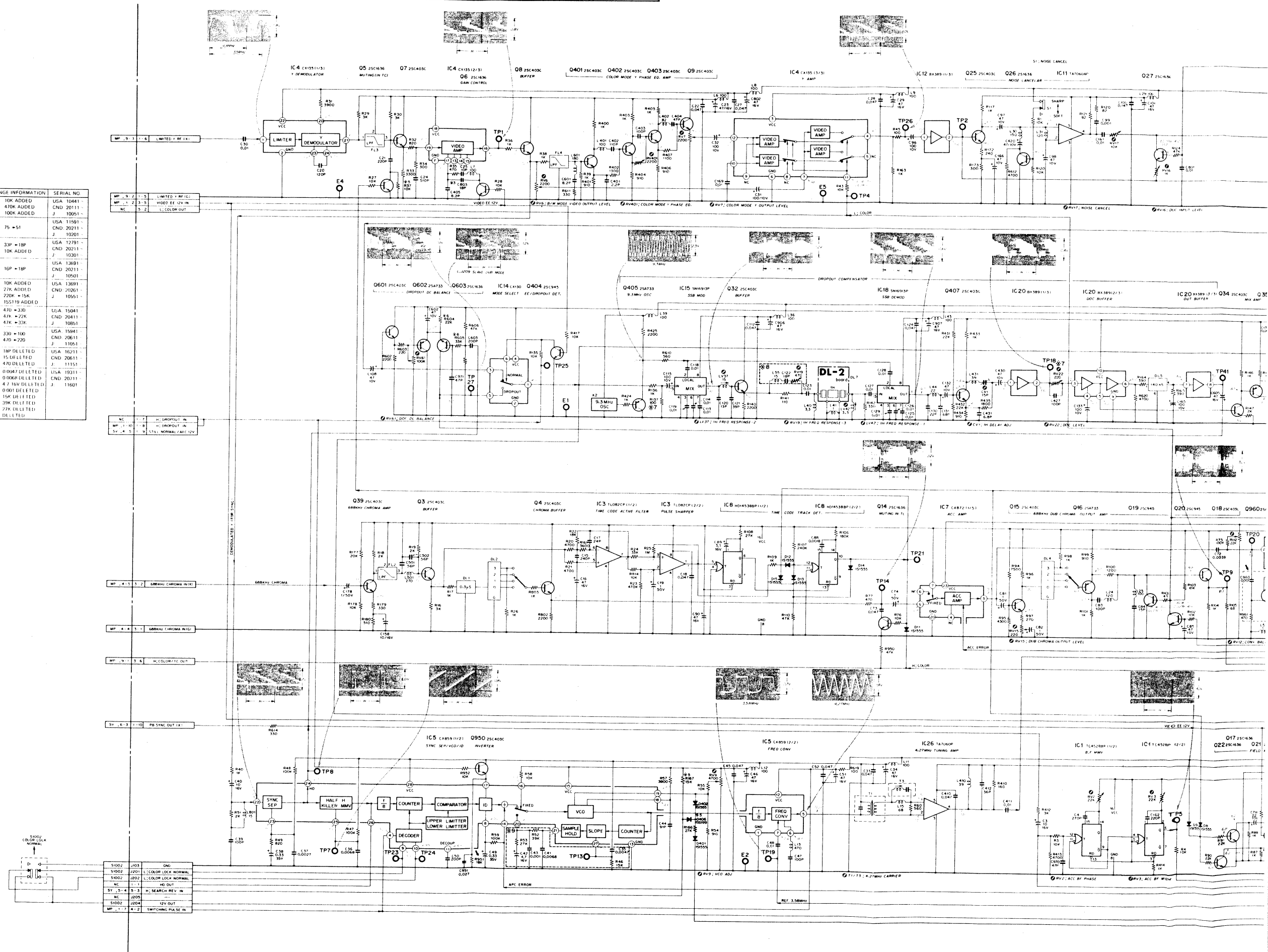


DM-22/DL-2

DM-22 (VIDEO DEMODULATOR)
DL-2

S/N 10441 AND LATER (USA)
S/N 20111 AND LATER (CND)

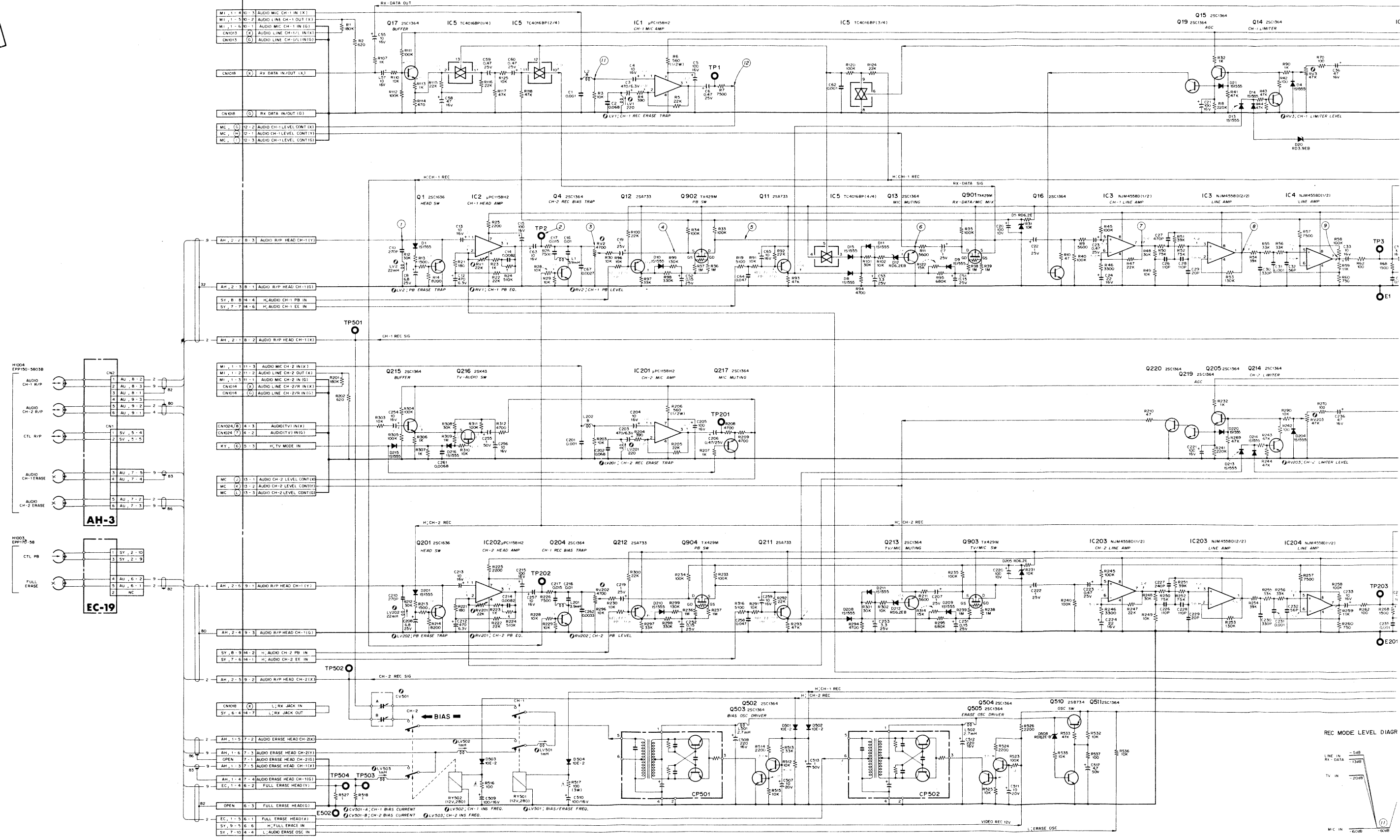
NOTE	MARK	CHANGE INFORMATION	SERIAL NO.
✕ 1	R054	10K ADDED	USA 10041
	RV8	470K ADDED	CNI 20111
	R41	100K ADDED	J 10201
✕ 2	R145	75 +51	USA 11569
			CNI 20111
✕ 3	C803	33P + 18P	USA 12791
	R126	10K ADDED	CNI 20111
			J 10301
✕ 4	C112	16P + 18P	USA 13691
			CNI 20111
✕ 5	R37	10K ADDED	USA 13691
	R166	27K ADDED	CNI 20611
	R167	220W + 15K	J 10551
	D406	155119 ADDED	
✕ 6	R171	470 + 330	USA 15041
	R604	47K + 27K	CNI 20411
	R436	47K + 33K	J 10651
✕ 7	R131	330 + 100	USA 15941
	R22	10K + 10K	CNI 20611
			J 11051
✕ 8	C122	18P DELETED	USA 16211
	R55	15P DELETED	CNI 20611
	RV19	470 DELETED	J 11151
	C45	010047 DELETED	USA 19311
✕ 9	C41	0100R DELETED	CNI 20111
	C43	0100V DELETED	J 11601
	C45	0100V DELETED	CNI 20111
	C43	0100V DELETED	J 11601
	R46	15K DELETED	
	R26	39K DELETED	
✕ 10	R53	27K DELETED	
	TP13	DELETED	

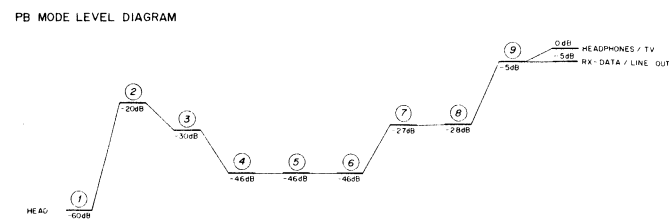
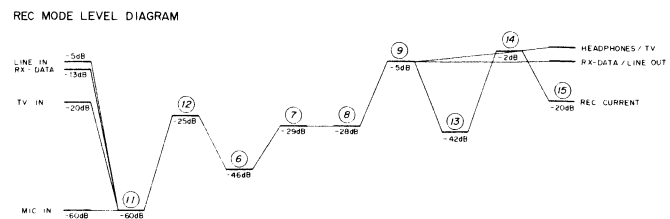
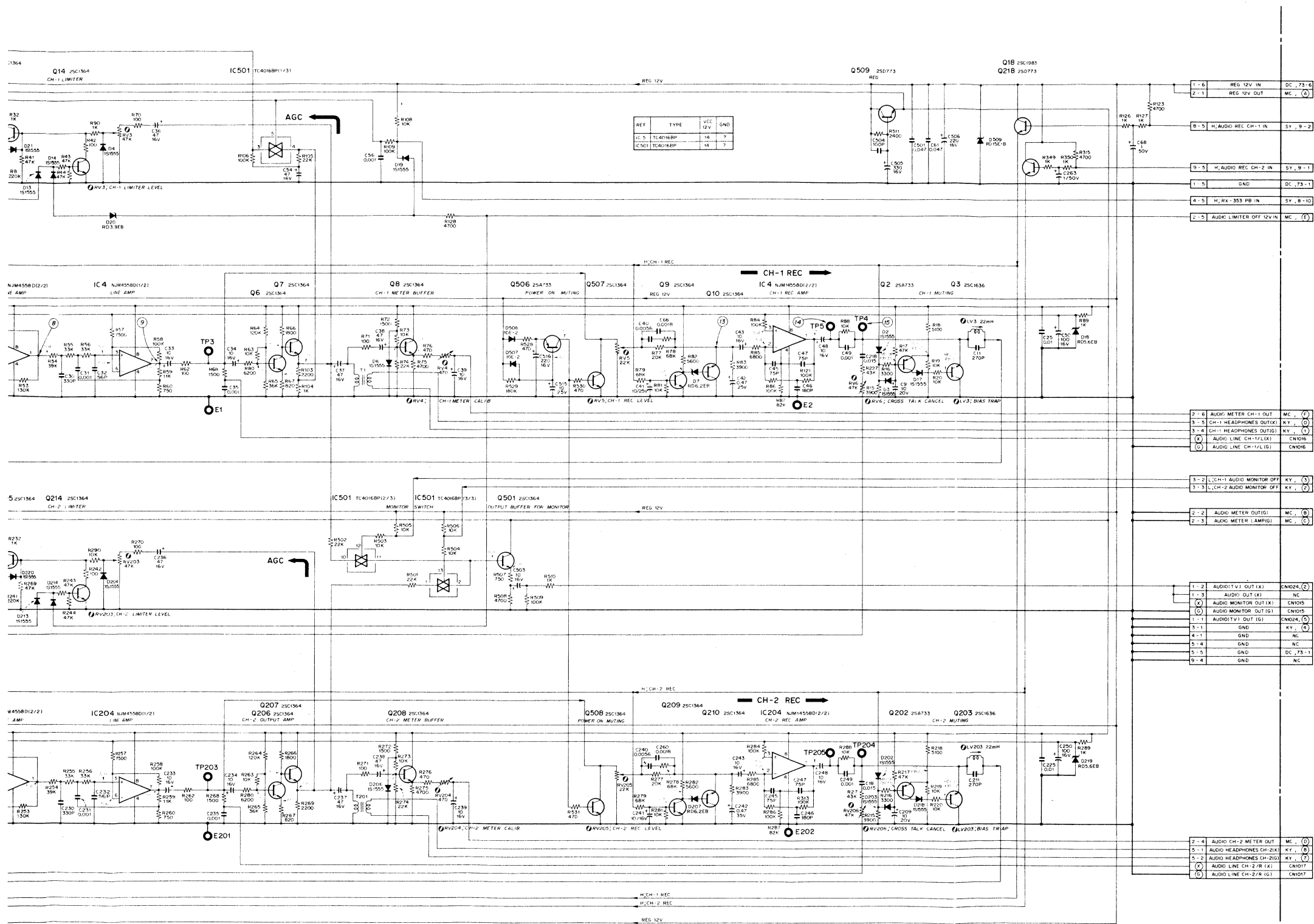




AU-21 (AUDIO)

S/N UP TO 10440 (USA)
S/N UP TO 20110 (CND)



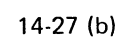
**AU-21**

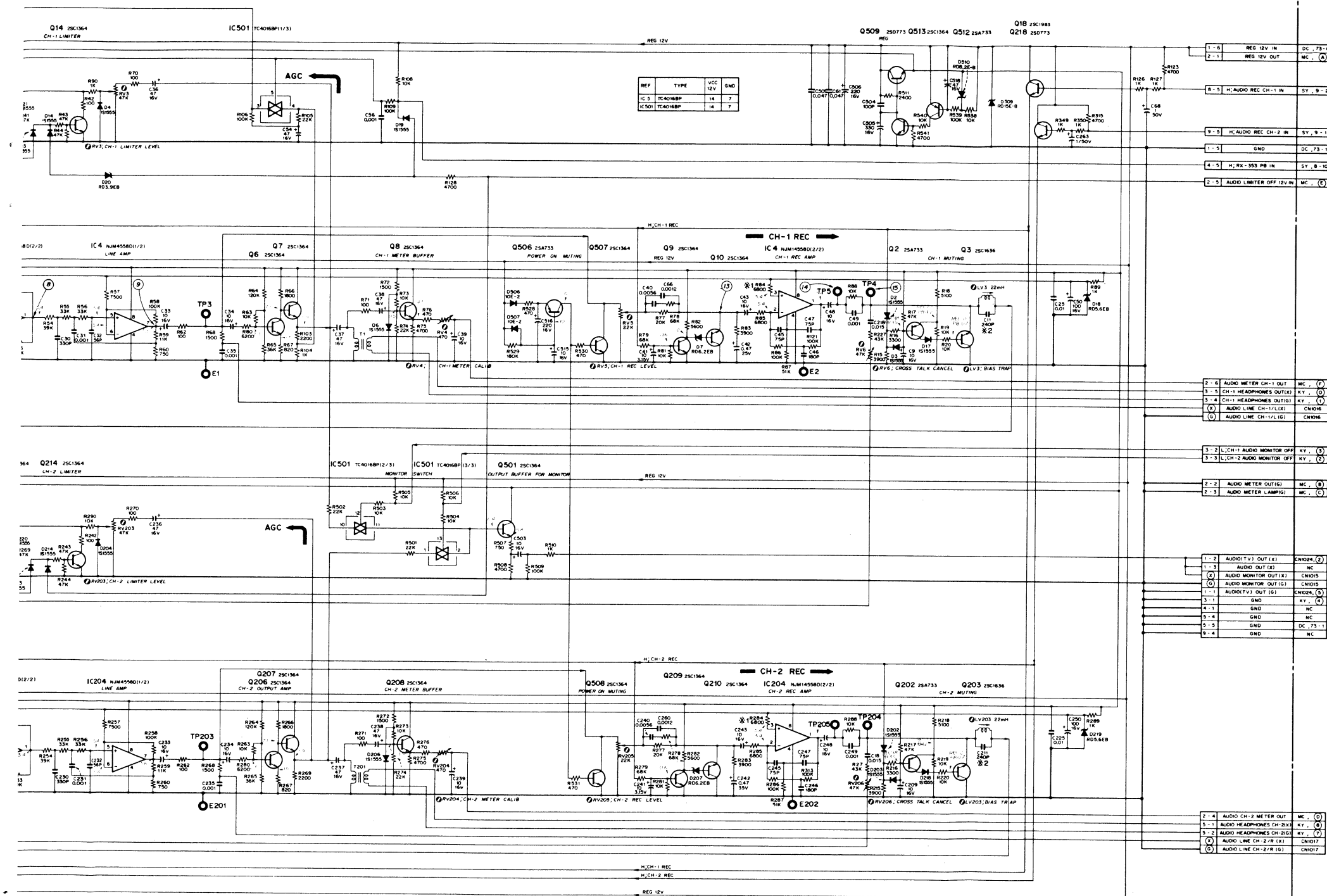
NOTE:

The shaded and -marked components are critical to safety.
Replace only with same components as specified.

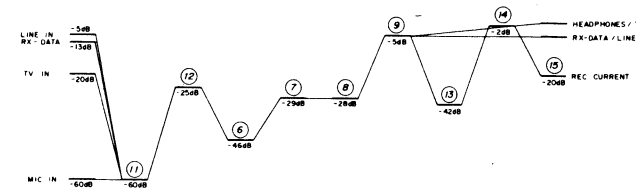
S/N 10441 AND LATER (USA)
S/N 20111 AND LATER (CND)

AU-21

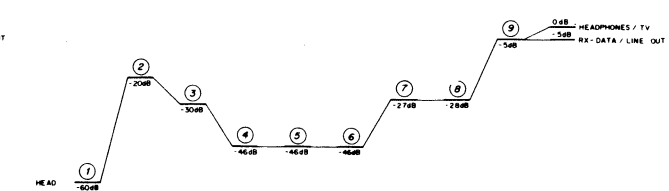




REC MODE LEVEL DIAGRAM



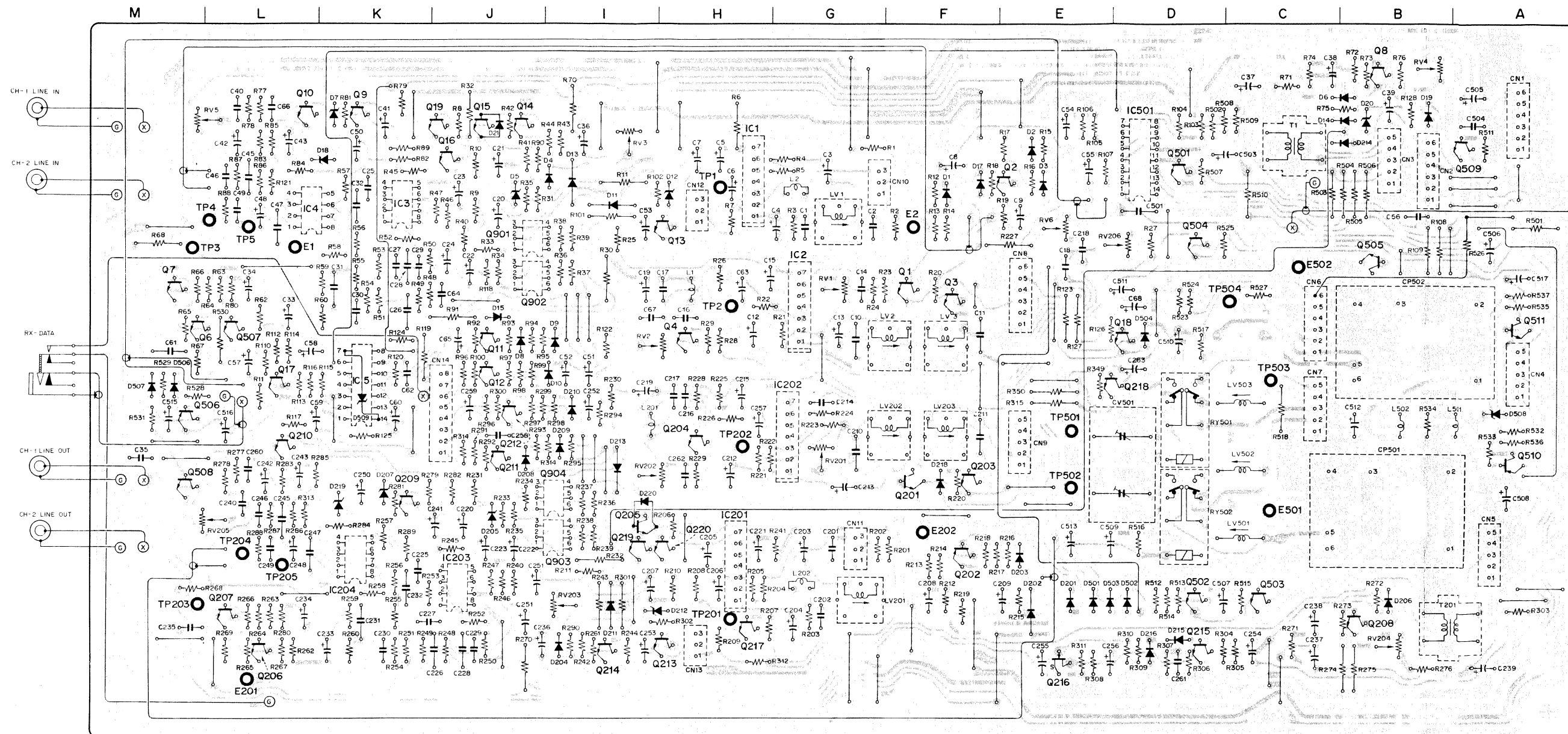
PB MODE LEVEL DIAGRAM



AU-21

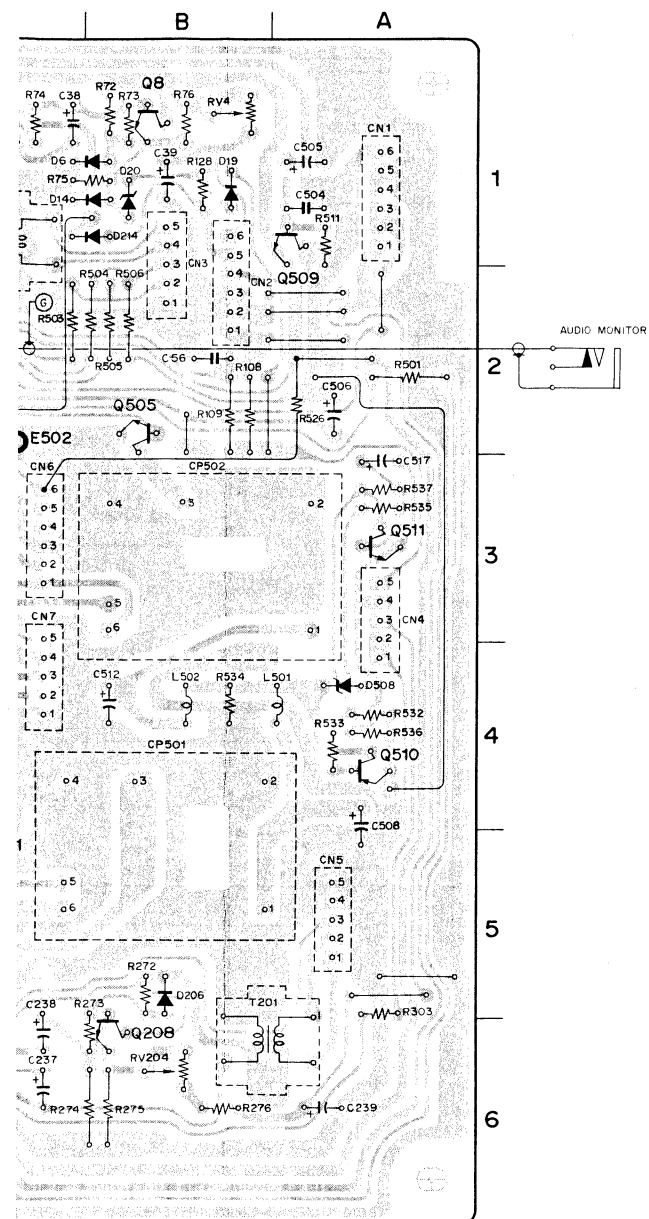
NOTE: The shaded and Δ -marked components are critical to safety. Replace only with same components as specified.

S/N UP TO 12790 (USA)
S/N UP TO 20210 (CND)



AU - 21 - SOLDERING SIDE -

CN1	A - 1	D1	F - 1	D201	E - 5	D501	E - 5	IC1	H - 2	Q1	F - 3	Q201	F - 4	Q501	D - 2	RV1	G - 3	TP1	H - 2
CN2	B - 2	D2	E - 1	D202	E - 5	D502	E - 5	IC2	G - 3	Q2	E - 2	Q202	F - 5	Q502	D - 5	RV2	I - 3	TP2	H - 3
CN3	B - 2	D3	E - 2	D203	E - 5	D503	E - 5	IC3	K - 2	Q3	F - 3	Q203	F - 4	Q503	C - 5	RV3	I - 1	TP3	M - 2
CN4	A - 3	D4	I - 2	D204	I - 6	D504	D - 3	IC4	L - 2	Q4	H - 3	Q204	H - 4	Q504	D - 2	RV4	B - 1	TP4	L - 2
CN5	A - 5	D5	J - 2	D205	J - 5	D506	M - 3	IC5	K - 4	Q6	M - 3	Q205	I - 5	Q505	B - 2	RV5	E - 1	TP5	L - 2
CN6	C - 3	D6	B - 1	D206	B - 5	D507	M - 3	IC201	H - 5	Q7	M - 3	Q206	L - 6	Q506	M - 4	RV6	E - 2	TP201	H - 6
CN7	C - 4	D7	K - 1	D207	K - 4	D508	A - 4	IC202	G - 4	Q8	B - 1	Q207	L - 6	Q507	L - 3	RV201	G - 4	TP202	H - 4
CN8	E - 3	D8	J - 3	D208	J - 4	D509	K - 3	IC203	J - 5	Q9	K - 1	Q208	B - 6	Q508	M - 4	RV202	I - 4	TP203	M - 5
CN9	E - 4	D9	I - 3	D209	I - 4			IC204	K - 5	Q10	L - 1	Q209	K - 5	Q509	A - 1	RV203	I - 5	TP204	L - 5
CN10	G - 2	D10	I - 3	D210	I - 4	E1	L - 2	IC501	D - 2	Q11	J - 3	Q210	L - 4	Q510	A - 4	RV204	B - 6	TP205	L - 5
CN11	G - 5	D11	I - 2	D211	I - 5	E2	F - 1			Q12	J - 3	Q211	J - 4	Q511	A - 3	RV205	L - 5	TP501	E - 4
CN12	H - 2	D12	H - 2	D212	I - 5	E201	L - 6	LV1	G - 2	Q13	H - 2	Q212	J - 4	Q901	J - 2	RV206	D - 2	TP502	E - 4
CN13	H - 6	D13	I - 2	D213	I - 4	E202	F - 5	LV2	F - 3	Q14	J - 1	Q213	H - 6	Q902	J - 3			TP503	C - 3
CN14	J - 4	D14	B - 1	D214	B - 1	E501	C - 5	LV3	F - 3	Q15	J - 1	Q214	I - 6	Q903	I - 5	RY501	D - 4	TP504	C - 3
		D15	J - 3	D215	D - 6	E502	C - 2	LV201	G - 5	Q16	J - 1	Q215	D - 6	Q904	I - 5	RY502	D - 5		
CP501	B - 5	D17	F - 2	D216	D - 6			LV202	F - 4	Q17	L - 3	Q216	E - 6						
CP502	B - 3	D18	K - 2	D218	F - 4			LV203	F - 4	Q18	D - 3	Q217	H - 6				T1	C - 1	
		D19	B - 1	D219	K - 5			LV501	C - 5	Q19	J - 1	Q218	D - 4				T201	B - 6	
CV501	D - 4	D20	B - 1	D220	I - 5			LV502	C - 4			Q219	I - 5						
		D21	J - 1					LV503	C - 4			Q220	H - 5						

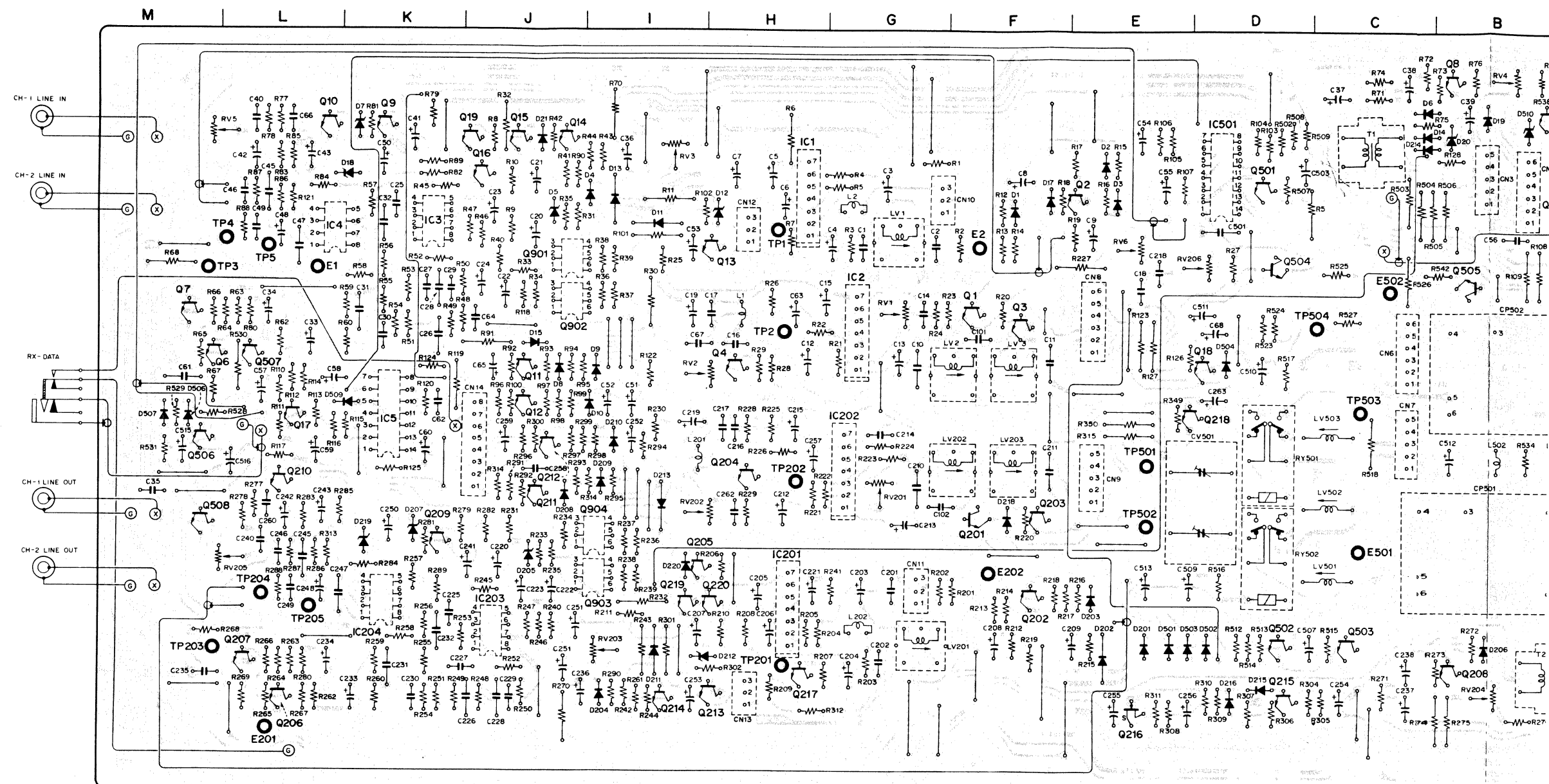


AU-21 - SOLDERING SIDE -

AU-21

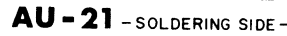
AU-21 (AUDIO)

S/N 12791 AND LATER (USA)
S/N 20211 AND LATER (CND)

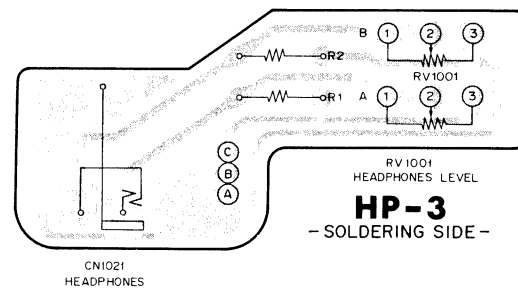
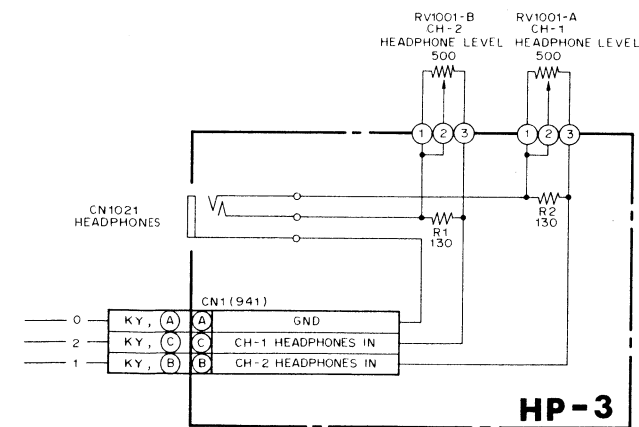
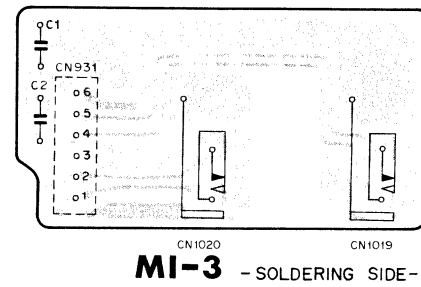
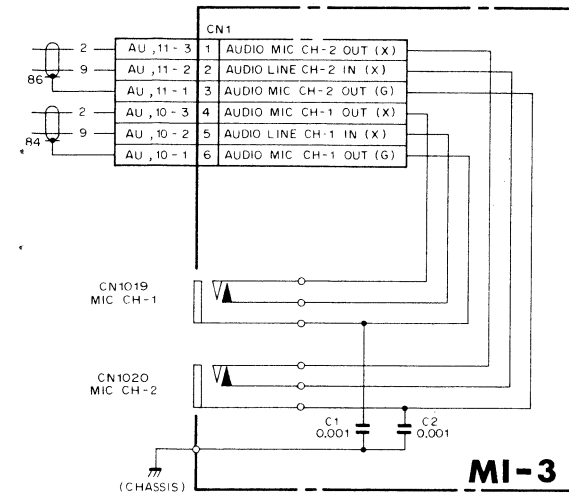


AU -

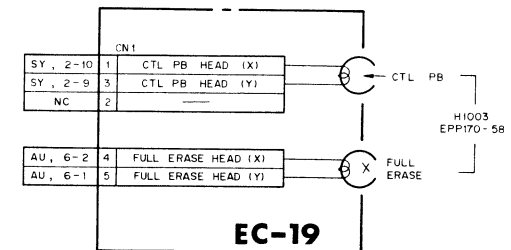
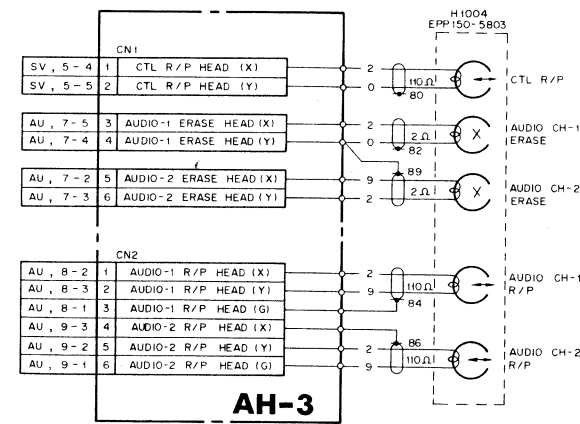
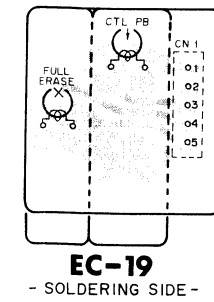
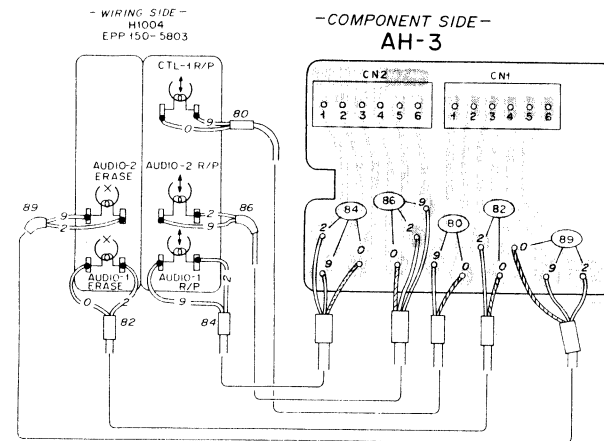
CN1	A - 1	D1	F - 1	D201	E - 5	D501	E - 5	IC1	H - 2	Q1	F - 3	Q201	F - 4	Q501	D - 2	RV1	G - 3	TP1	H - 2
CN2	B - 2	D2	E - 1	D202	E - 5	D502	D - 5	IC2	G - 3	Q2	E - 2	Q202	F - 5	Q502	D - 5	RV2	I - 3	TP2	H - 3
CN3	B - 2	D3	E - 2	D203	E - 5	D503	E - 5	IC3	K - 2	Q3	F - 3	Q203	F - 4	Q503	C - 5	RV3	I - 1	TP3	M - 2
CN4	A - 3	D4	I - 2	D204	I - 6	D504	D - 3	IC4	L - 2	Q4	H - 3	Q204	H - 4	Q504	D - 2	RV4	B - 1	TP4	L - 2
CN5	A - 5	D5	J - 2	D205	B - 5	D505	M - 3	IC5	K - 4	Q6	M - 3	Q205	I - 5	Q505	B - 2	RV5	L - 1	TP5	L - 2
CN6	C - 3	D6	B - 1	D206	B - 5	D506	M - 3	IC201	H - 5	Q7	M - 3	Q206	L - 6	Q506	M - 4	RV6	E - 2	TP201	H - 6
CN7	C - 4	D7	K - 1	D207	K - 4	D507	A - 4	IC202	G - 4	Q8	B - 1	Q207	L - 8	Q507	L - 3	RV201	G - 4	TP202	H - 4
CN8	E - 3	D8	J - 3	D208	J - 4	D508	K - 3	IC203	J - 5	Q9	K - 1	Q208	B - 6	Q508	M - 4	RV202	I - 4	TP203	M - 5
CN9	E - 4	D9	I - 3	D209	I - 4	D510	B - 1	IC204	K - 5	Q10	L - 1	Q209	K - 5	Q509	A - 1	RV203	I - 5	TP204	L - 5
CN10	G - 2	D10	I - 3	D210	I - 4			IC501	D - 2	Q11	J - 3	Q210	L - 4	Q510	A - 4	RV204	B - 6	TP205	L - 5
CN11	G - 5	D11	I - 2	D211	I - 5	E1	L - 2			Q12	J - 4	Q211	J - 4	Q511	A - 3	RV205	L - 5	TP501	E - 4
CN12	H - 2	D12	H - 2	D212	I - 5	E2	F - 1	LV1	G - 2	Q13	H - 2	Q212	J - 4	Q512	B - 1	RV206	D - 2	TP502	E - 4
CN13	H - 6	D13	I - 2	D213	I - 4	E201	L - 6	LV2	F - 3	Q14	J - 1	Q213	H - 6	Q513	A - 1			TP503	C - 3
CN14	J - 4	D14	B - 1	D214	B - 1	E202	F - 5	LV3	F - 3	Q15	J - 1	Q214	I - 6	Q901	J - 2	RY501	D - 4	TP504	C - 3
		D15	J - 3	D215	D - 6	E501	C - 5	LV201	G - 5	Q16	J - 1	Q215	D - 6	Q902	J - 3				
CP501	B - 5	D17	F - 2	D216	D - 6	E502	C - 2	LV202	F - 4	Q17	L - 3	Q216	E - 6	Q903	I - 5				
CP502	B - 3	D18	K - 2	D218	F - 4			LV203	F - 4	Q18	D - 3	Q217	H - 6	Q904	I - 5				
		D19	B - 1	D219	K - 5			LV501	C - 5	Q19	J - 1	Q218	D - 4			T1	C - 1		
CV501	D - 4	D20	B - 1	D220	I - 5			LV502	C - 4			Q219	I - 5			T201	B - 6		
		D21	J - 1					LV503	C - 4			Q220	H - 5						



MI-3 (MIC INPUT)
HP-3 (HEADPHONES)



EC-19 (ERASE & CTL HEAD)
AH-3 (AUDIO R/P & CTL R/P & ERASE HEAD)

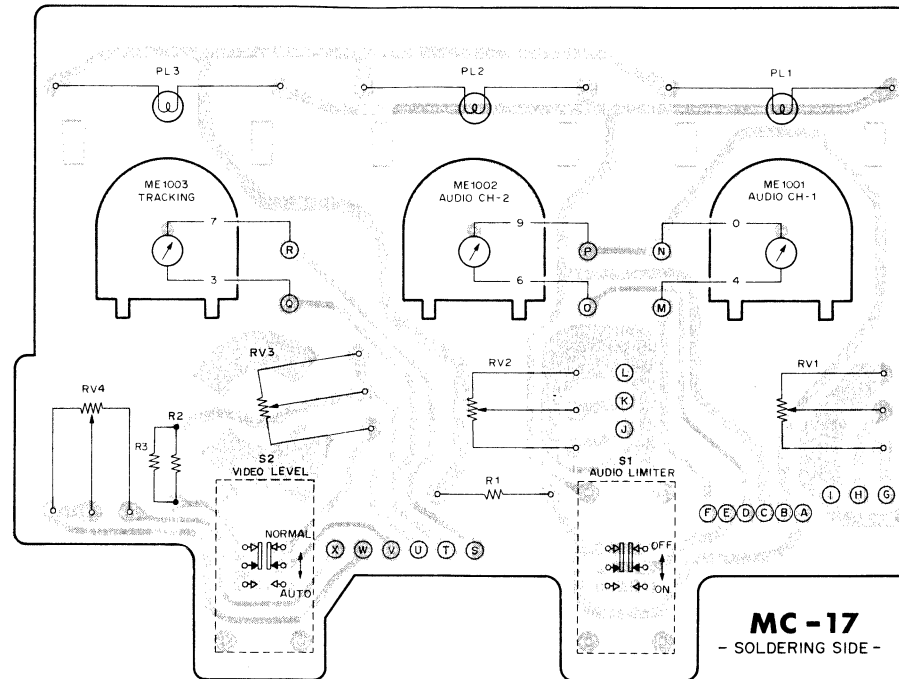


MC-17 (METER)

S/N UP TO 1014
S/N UP TO 2007

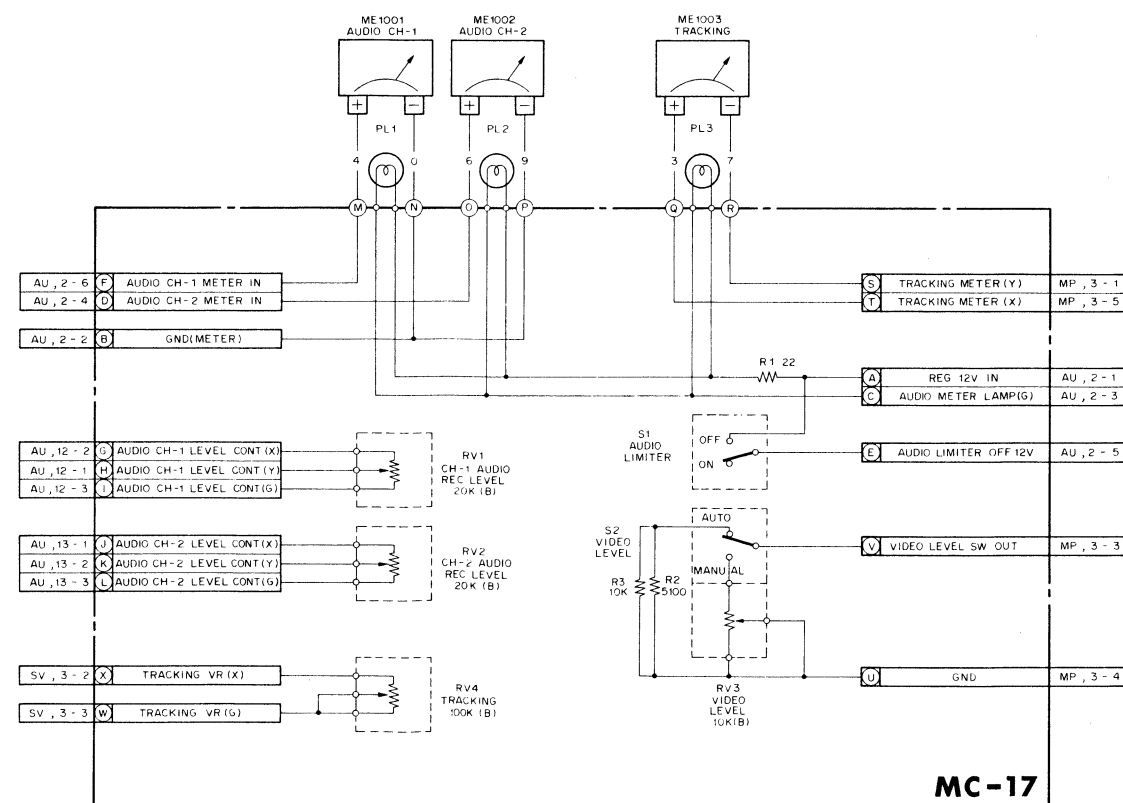
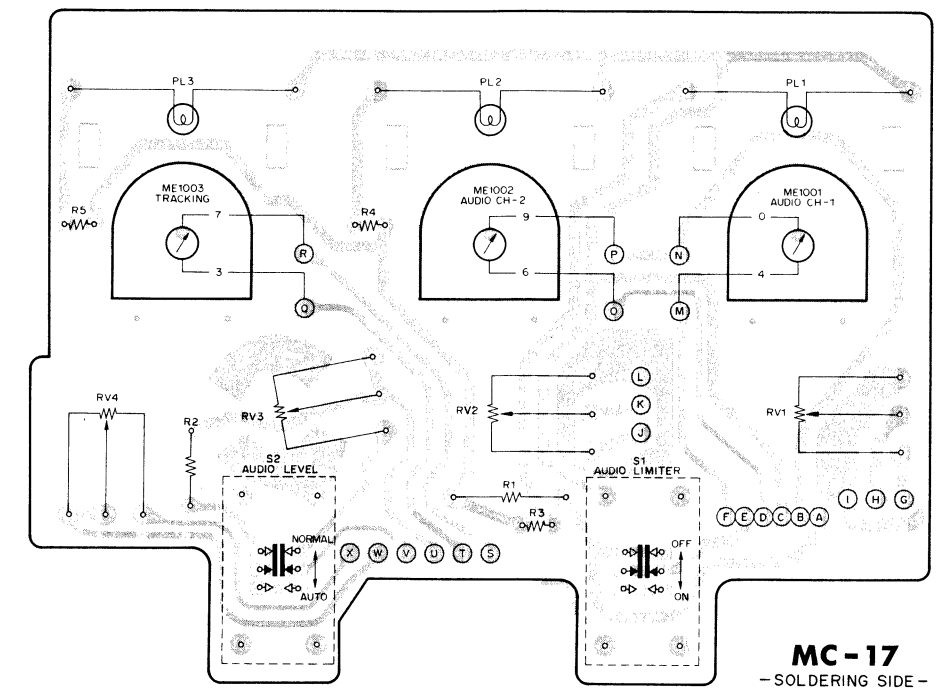
MC-17 (METER CONTROL)

S/N UP TO 10140 (USA)
S/N UP TO 20010 (CND)

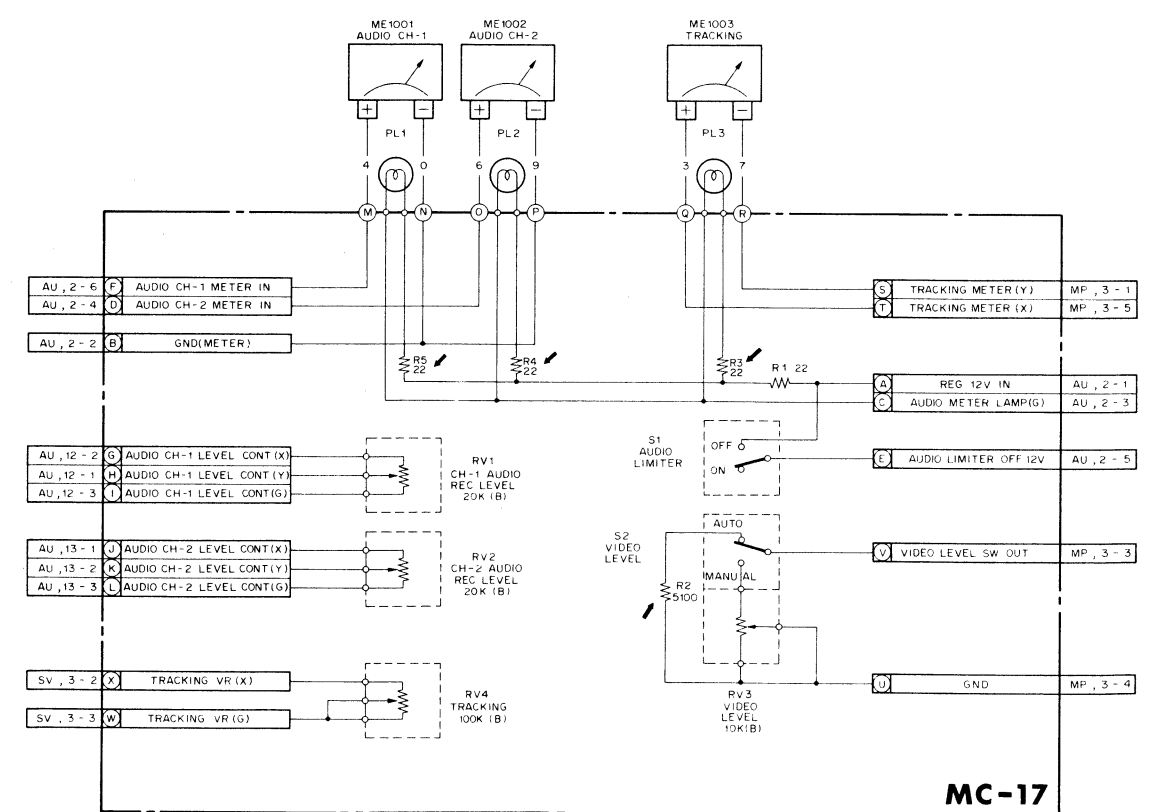


MC-17 (METER CONTROL)

S/N 10141 AND LATER (USA)
S/N 20011 AND LATER (CND)



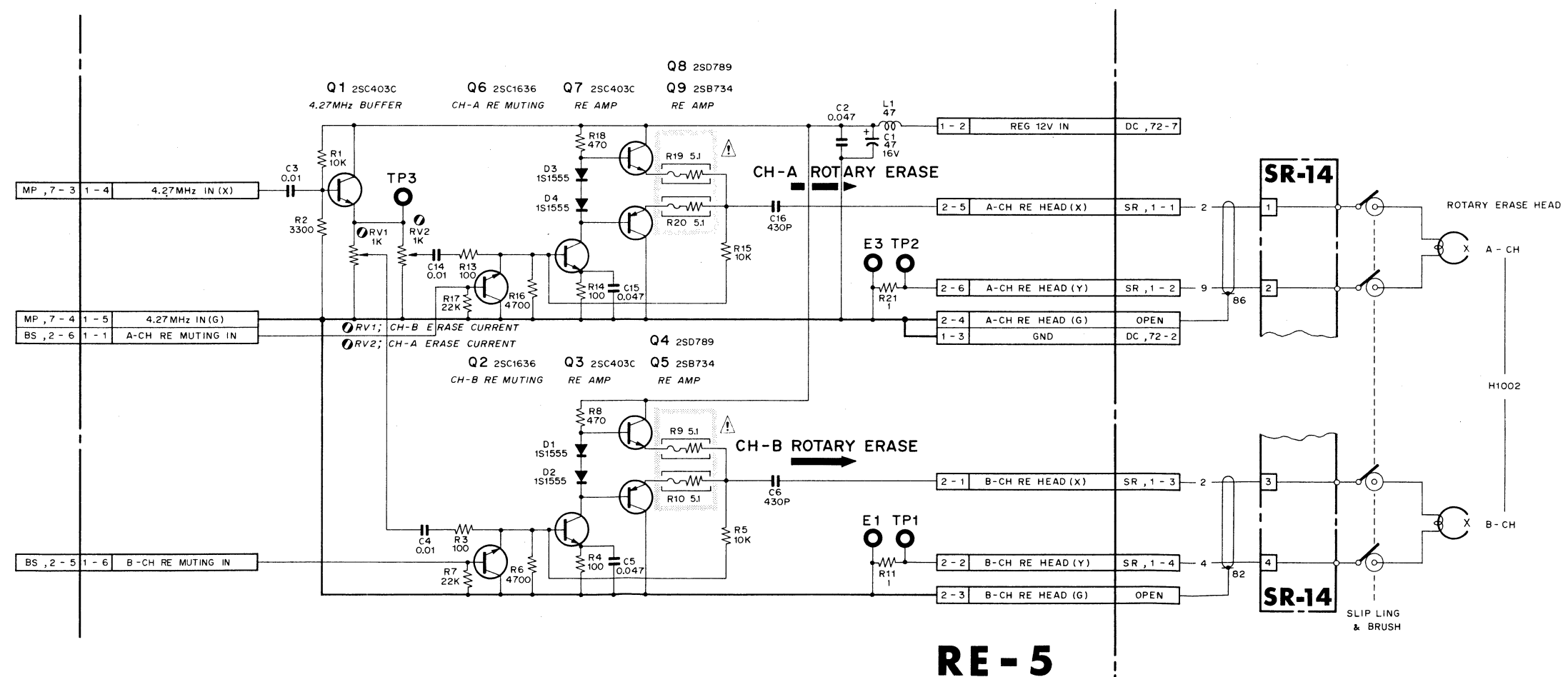
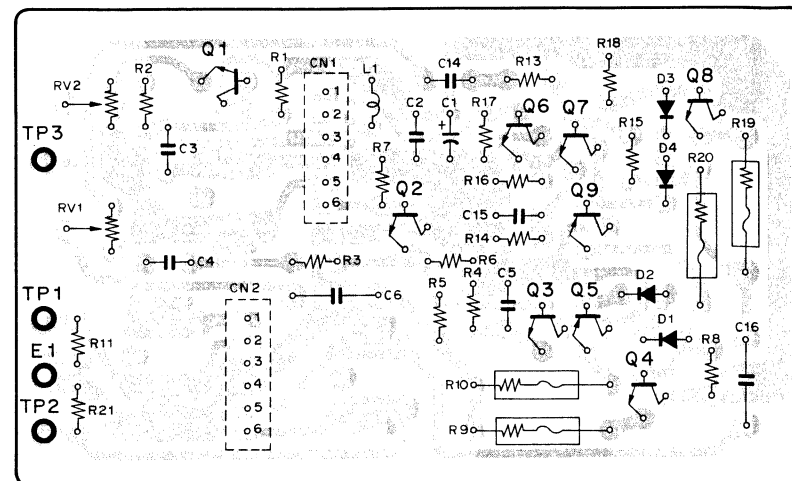
14-36 (a)



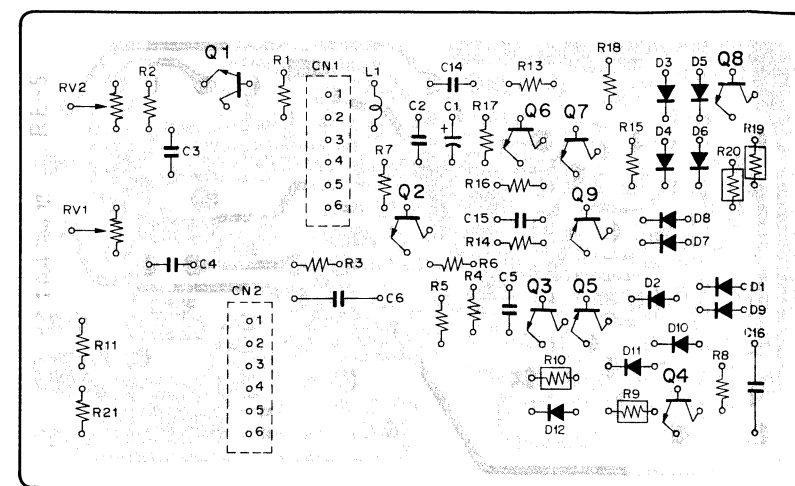
14-36 (b)

RE-5 (ROTARY ERASE)

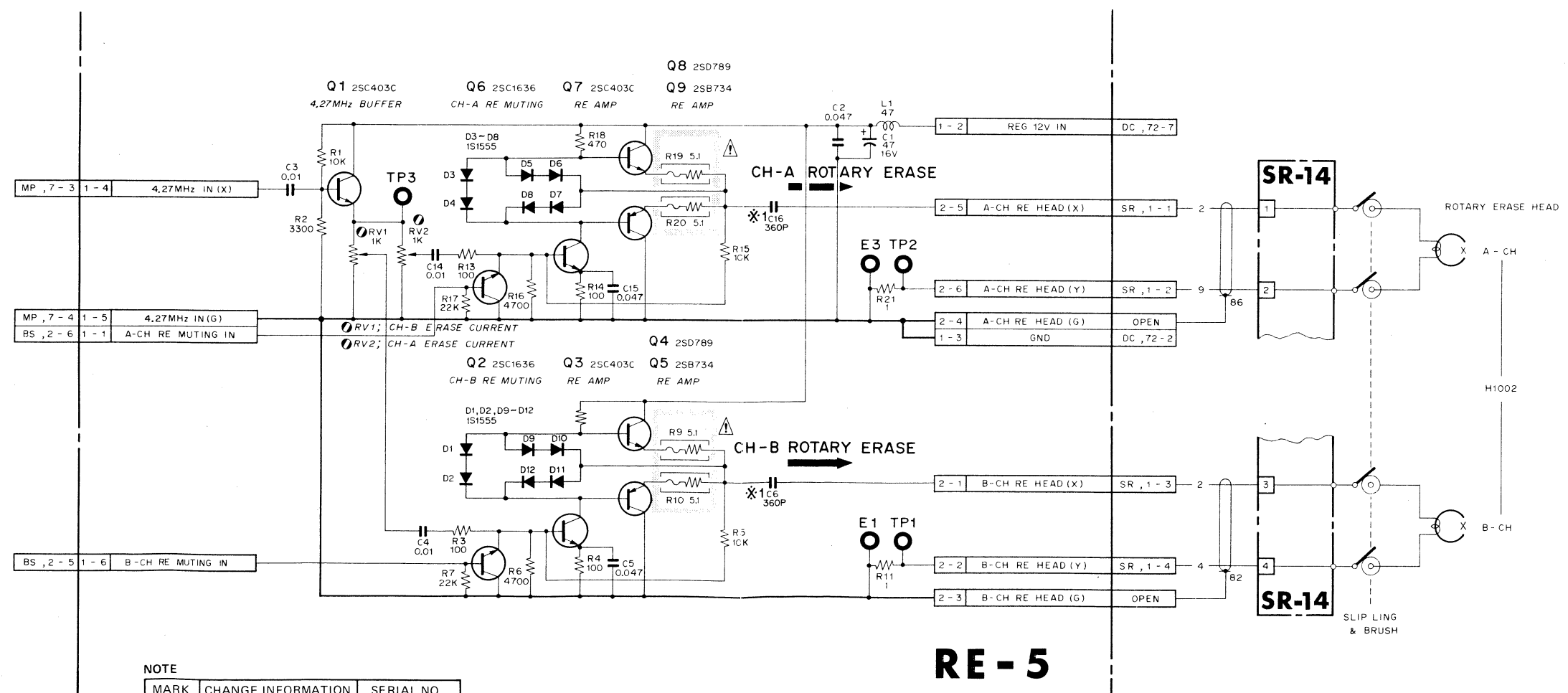
S/N UP TO 10440 (USA)
S/N UP TO 20110 (CND)



S/N 10441 AND LATER (USA)
S/N 20111 AND LATER (CND)



RE-5 - SOLDERING SIDE -
1-604-968-12
VO-5850
VO-5850P
VO-5850S



NOTE

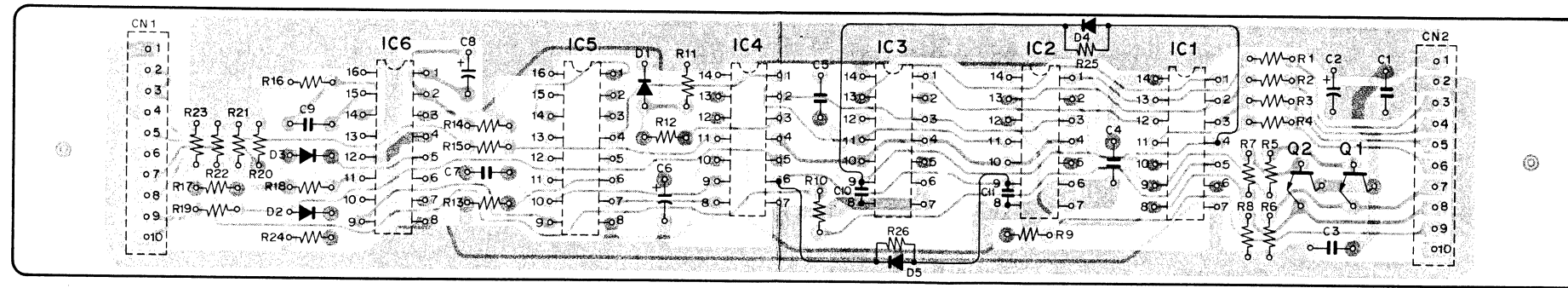
MARK	CHANGE INFORMATION	SERIAL NO.
✱ 1	C6 430P → 360P	USA: 16211 ~ CND: 20611 ~ J: 11151 ~ PM: 10031 ~

RE-5

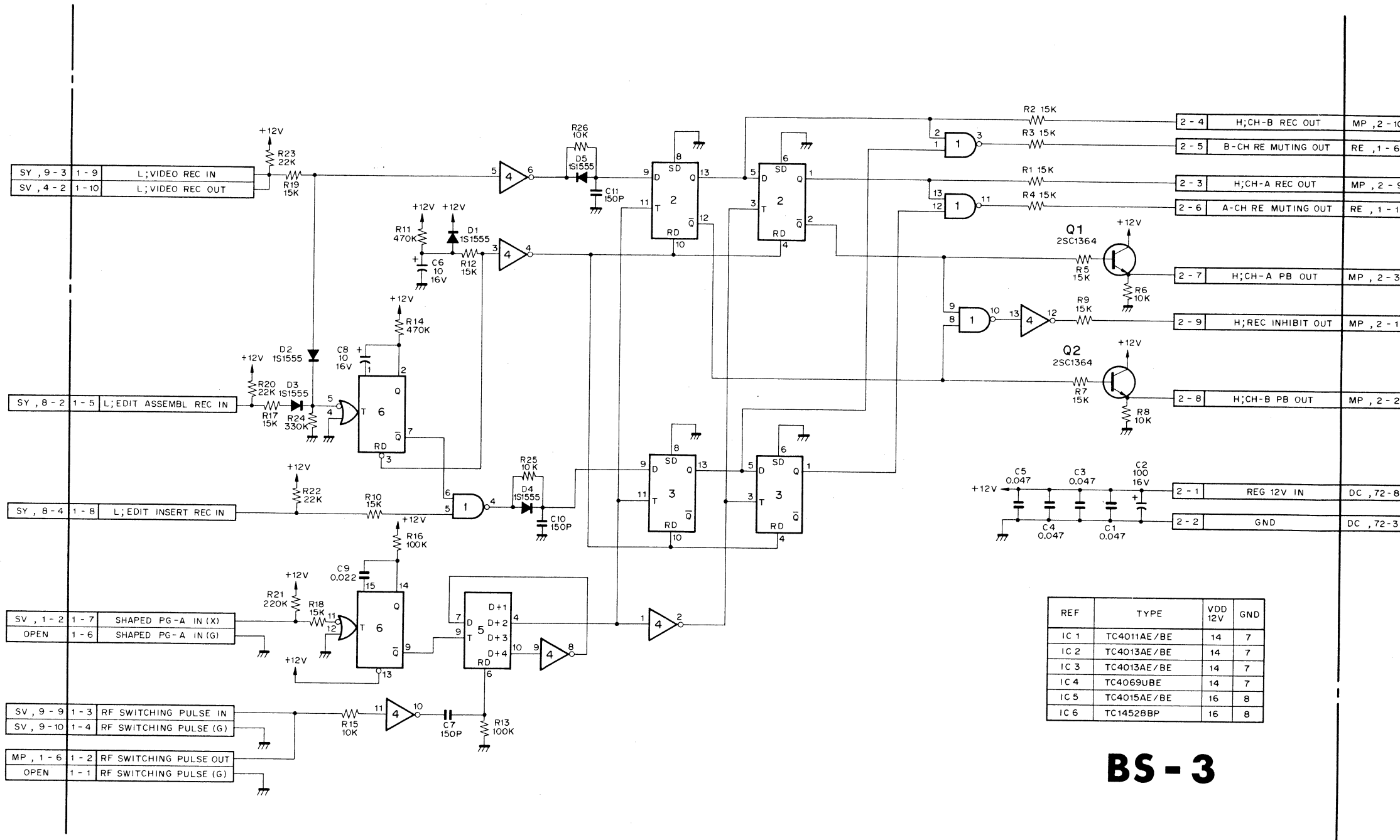
NOTE: The shaded and ⚠-marked components are critical to safety. Replace only with same components as specified.

S/N UP TO 10140 (USA)
S/N UP TO 20010 (CND)

S/N 10141 ~ 136
S/N 20011 ~ 20



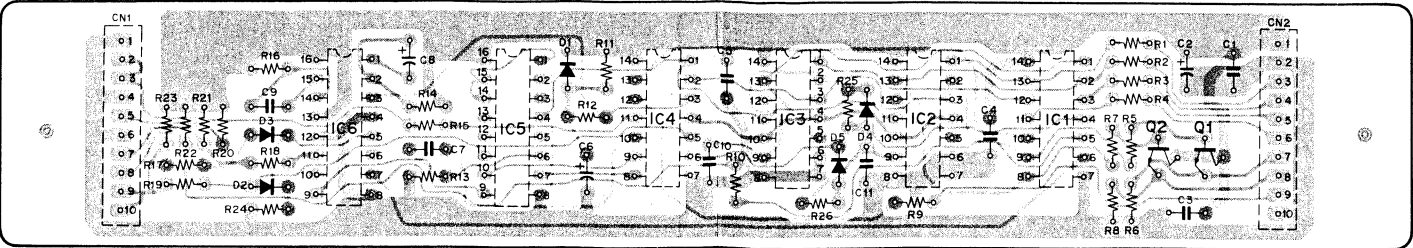
BS-3 -SOLDERING SIDE-



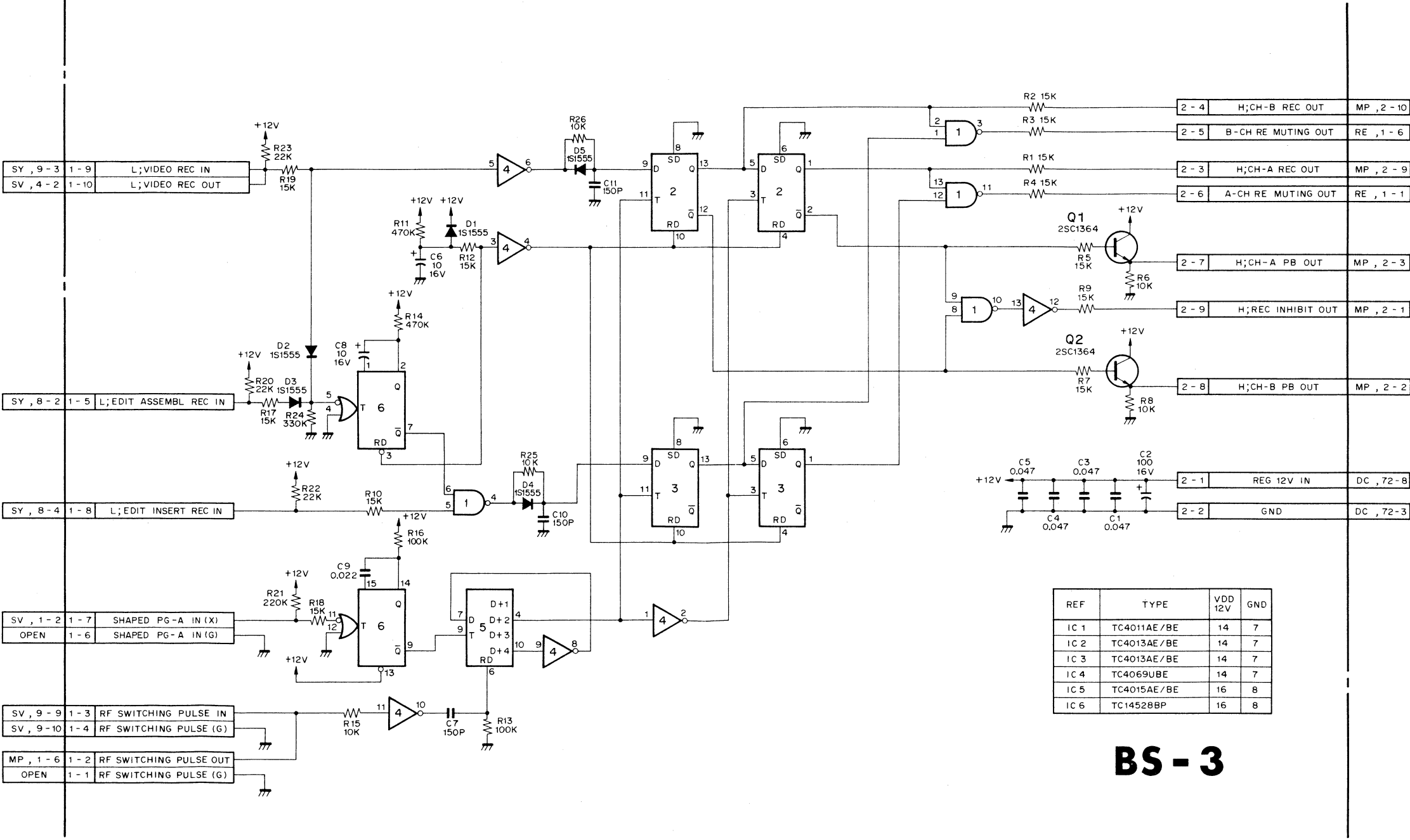
BS-3

BS-3 (BLANKING SW)

S/N 10141 ~ 13690 (USA)
S/N 20011 ~ 20210 (CND)



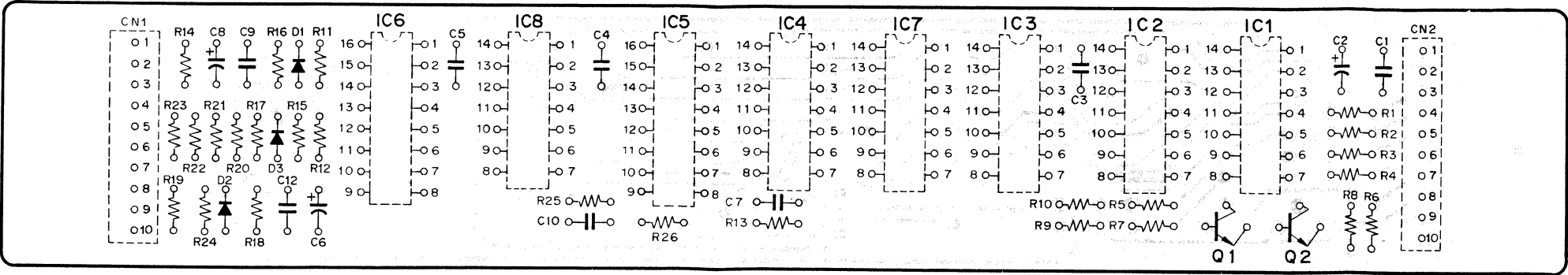
BS-3 -SOLDERING SIDE-



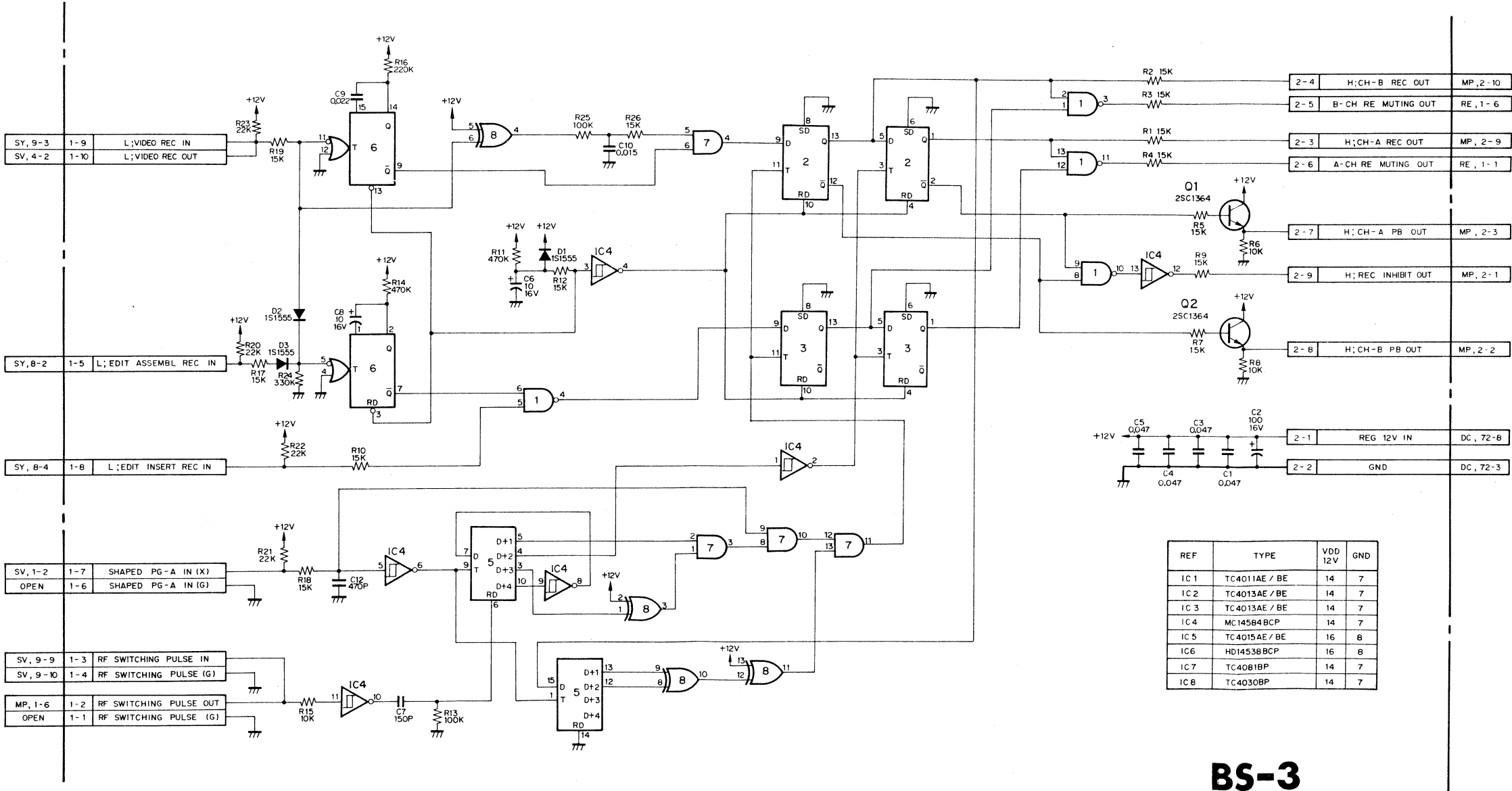
BS-3

BS-3 (BLANKING SW)

S/N 13691 AND LATER (USA)
S/N 20211 AND LATER (CND)



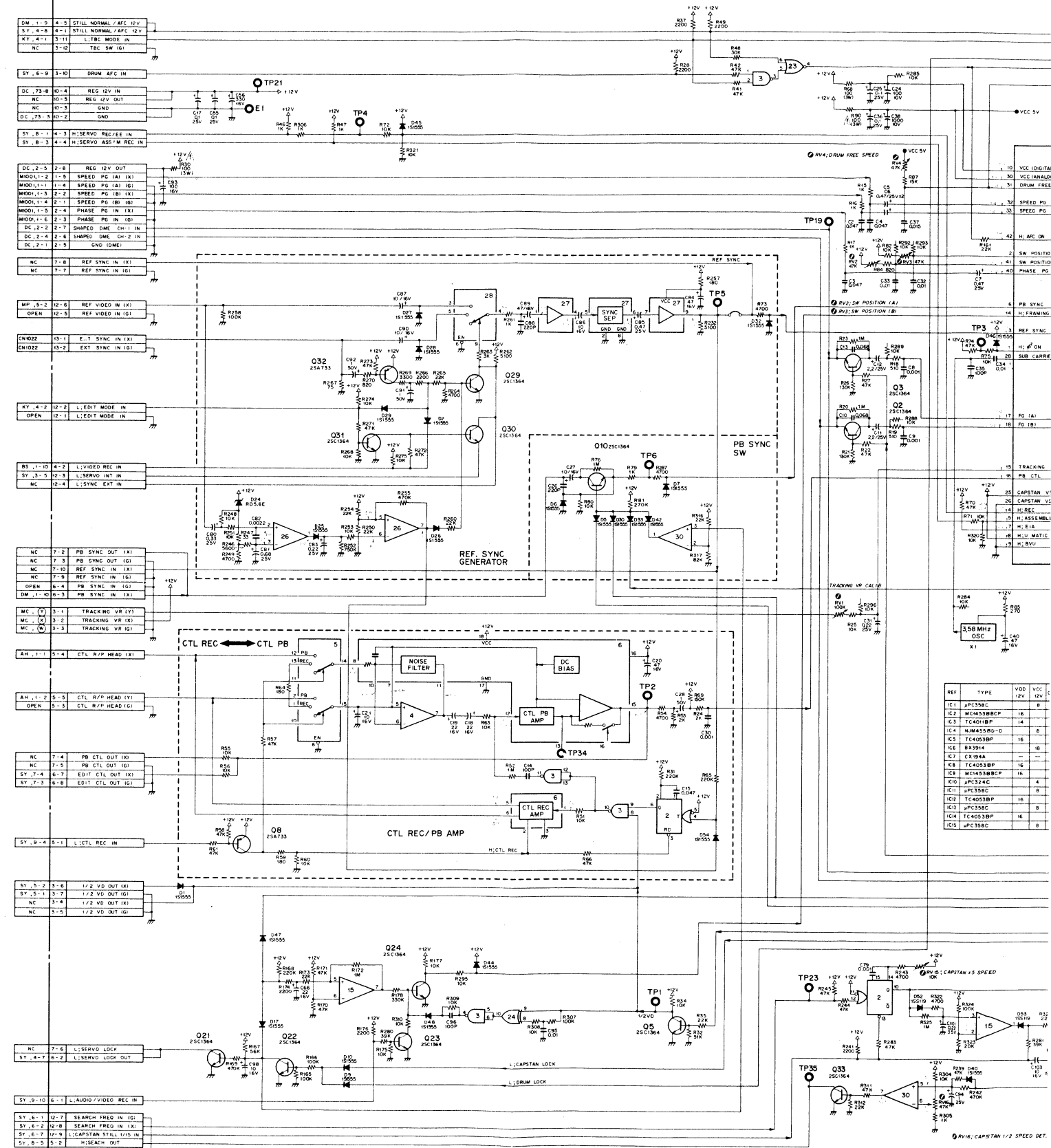
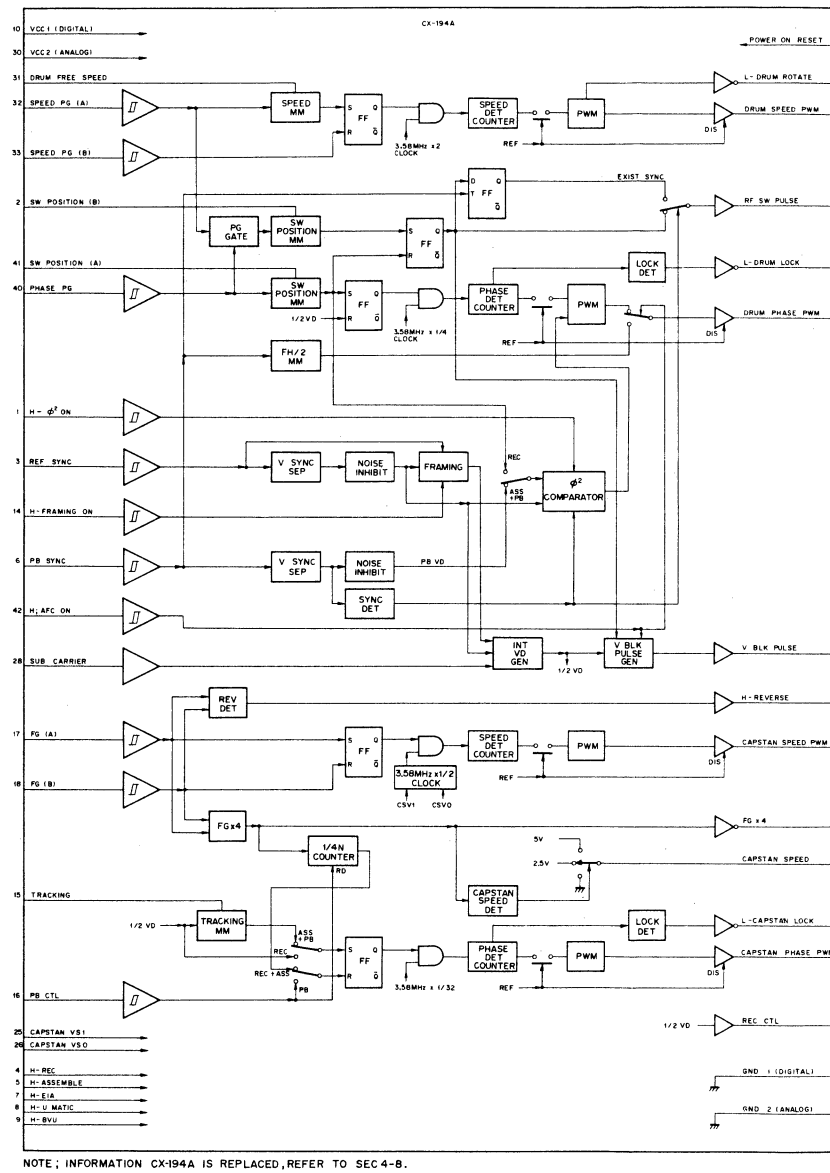
BS-3 - SOLDERING SIDE -

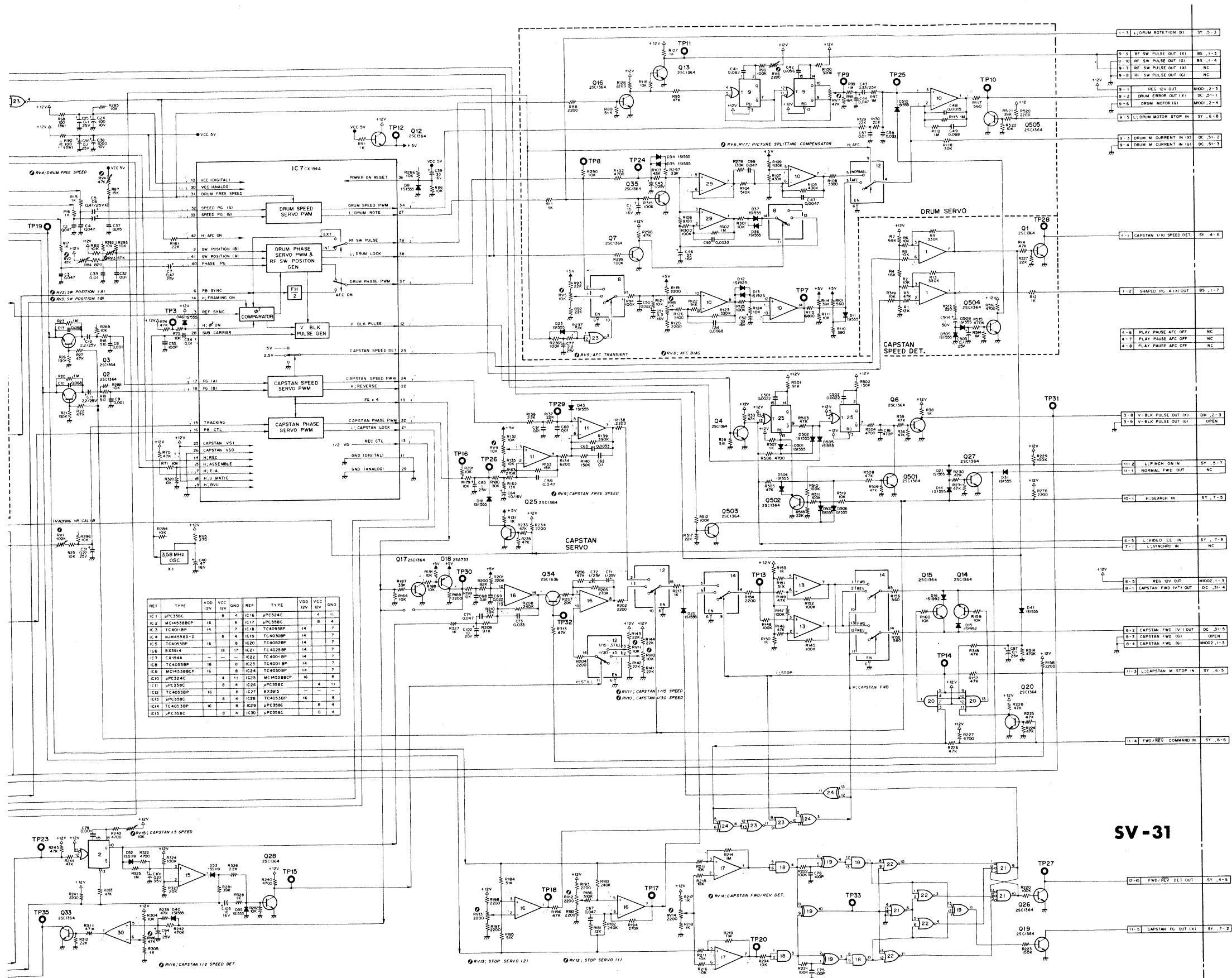


BS-3

SV-31 (DRUM/CAPSTAN SERVO)

S/N UP TO 10140 (USA)
S/N UP TO 20010 (CND)





SV-31

NOTE:

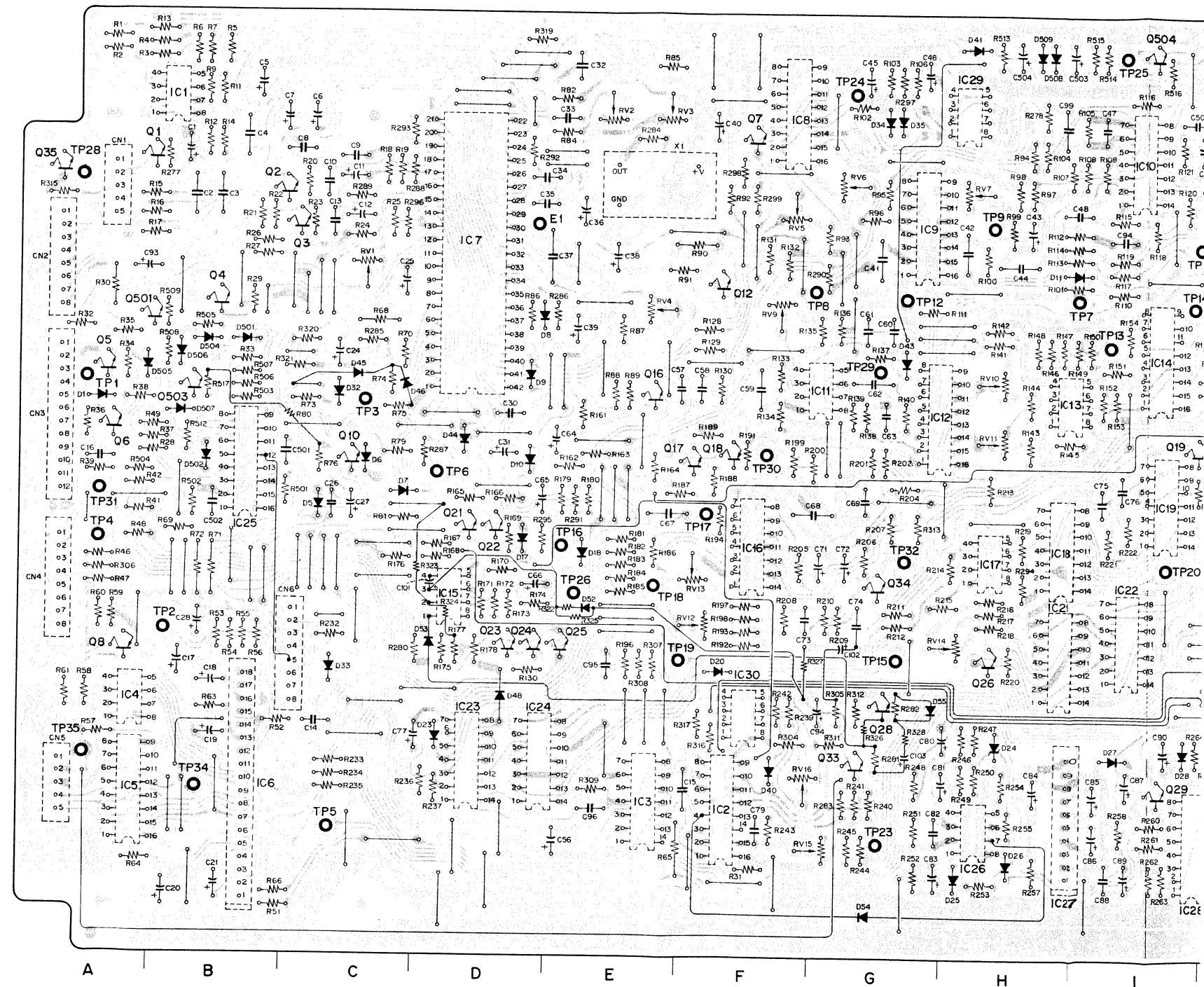
The shaded and Δ -marked components are critical to safety.
Replace only with same components as specified.

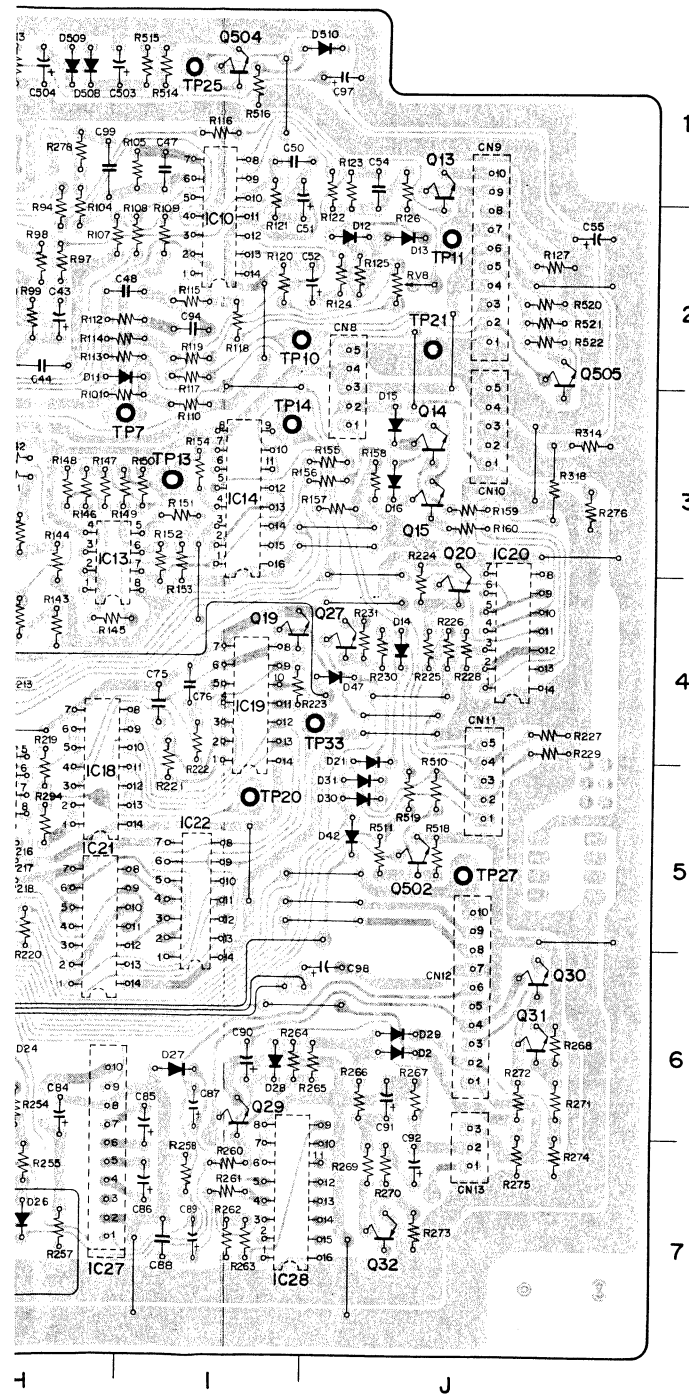
SV-31 (DRUM / CAPSTAN SERVO)

S/N UP TO 10140 (USA)
S/N UP TO 20010 (CND)

CN1	A-2	IC1	B-1	RV1	C-2
CN2	A-2	IC2	F-7	RV2	E-1
CN3	A-4	IC3	E-6	RV3	E-1
CN4	A-5	IC4	A-6	RV4	E-3
CN5	A-6	IC5	A-6	RV5	F-2
CN6	C-5	IC6	B-5	RV6	G-2
CN8	J-2	IC7	D-2	RV7	H-2
CN9	J-2	IC8	F-1	RV8	J-2
CN10	J-3	IC9	G-2	RV9	F-3
CN11	J-5	IC10	I-2	RV10	H-3
CN12	J-6	IC11	G-3	RV11	H-4
CN13	J-7	IC12	G-4	RV12	F-5
		IC13	H-3	RV13	F-5
		IC14	I-3	RV14	H-5
D1	A-3	IC15	D-5	RV15	G-7
D2	J-6	IC16	F-5	RV16	F-6
D5	C-4	IC17	H-5		
D6	C-4	IC18	H-5	TP1	A-3
D7	C-4	IC19	I-4	TP2	B-5
D8	D-3	IC20	J-4	TP3	C-3
D9	D-3	IC21	H-5	TP4	A-5
D10	D-4	IC22	I-5	TP5	C-7
D11	I-2	IC23	D-6	TP6	D-4
D12	J-2	IC24	D-6	TP7	I-3
D13	J-4	IC25	B-4	TP8	G-3
D14	J-4	IC26	H-7	TP9	H-2
D15	J-3	IC27	H-7	TP10	I-2
D16	J-3	IC28	I-8	TP11	J-2
D17	D-4	IC29	H-1	TP12	G-3
D18	E-5	IC30	F-6	TP13	I-3
D20	F-6			TP14	I-3
D21	J-4	Q1	B-2	TP15	G-5
D23	D-6	Q2	C-2	TP16	E-5
D24	H-6	Q3	C-2	TP17	F-4
D25	H-7	Q4	B-3	TP18	E-5
D26	H-7	Q5	A-3	TP19	F-5
D27	I-6	Q6	A-4	TP20	I-5
D28	I-6	Q7	F-1	TP21	J-2
D29	J-6	Q8	A-5	TP22	G-7
D30	J-5	Q9	C-4	TP23	G-1
D31	J-5	Q10	C-4	TP24	I-1
D32	C-3	Q11	F-3	TP25	E-5
D33	C-6	Q12	J-1	TP26	E-5
D34	G-1	Q13	J-1	TP27	J-5
D35	G-1	Q14	J-3	TP28	A-2
D40	F-6	Q15	J-3	TP29	G-3
D41	H-1	Q16	E-3	TP30	F-4
D42	J-5	Q17	F-4	TP31	A-4
D43	G-3	Q18	F-4	TP32	G-5
D44	D-4	Q19	I-4	TP33	J-4
D45	C-3	Q20	J-4	TP34	B-6
D46	C-3	Q21	D-4	TP35	A-6
D47	J-4	Q22	D-4		
D48	D-6	Q23	D-5		
D49	E-5	Q24	D-5		
D53	D-5	Q25	E-5		
D54	G-7	Q26	H-5		
D55	G-6	Q27	J-4		
D501	B-3	Q28	G-6		
D502	B-4	Q29	I-6		
D504	B-3	Q30	J-6		
D505	A-3	Q31	J-6		
D506	B-3	Q32	J-7		
D507	B-4	Q33	G-6		
D508	H-1	Q34	G-5		
D509	H-1	Q35	A-2		
D510	J-1	Q501	B-3		
		Q502	J-5		
		Q503	C-2		
E1	D-2	Q504	I-1		
		Q505	J-2		

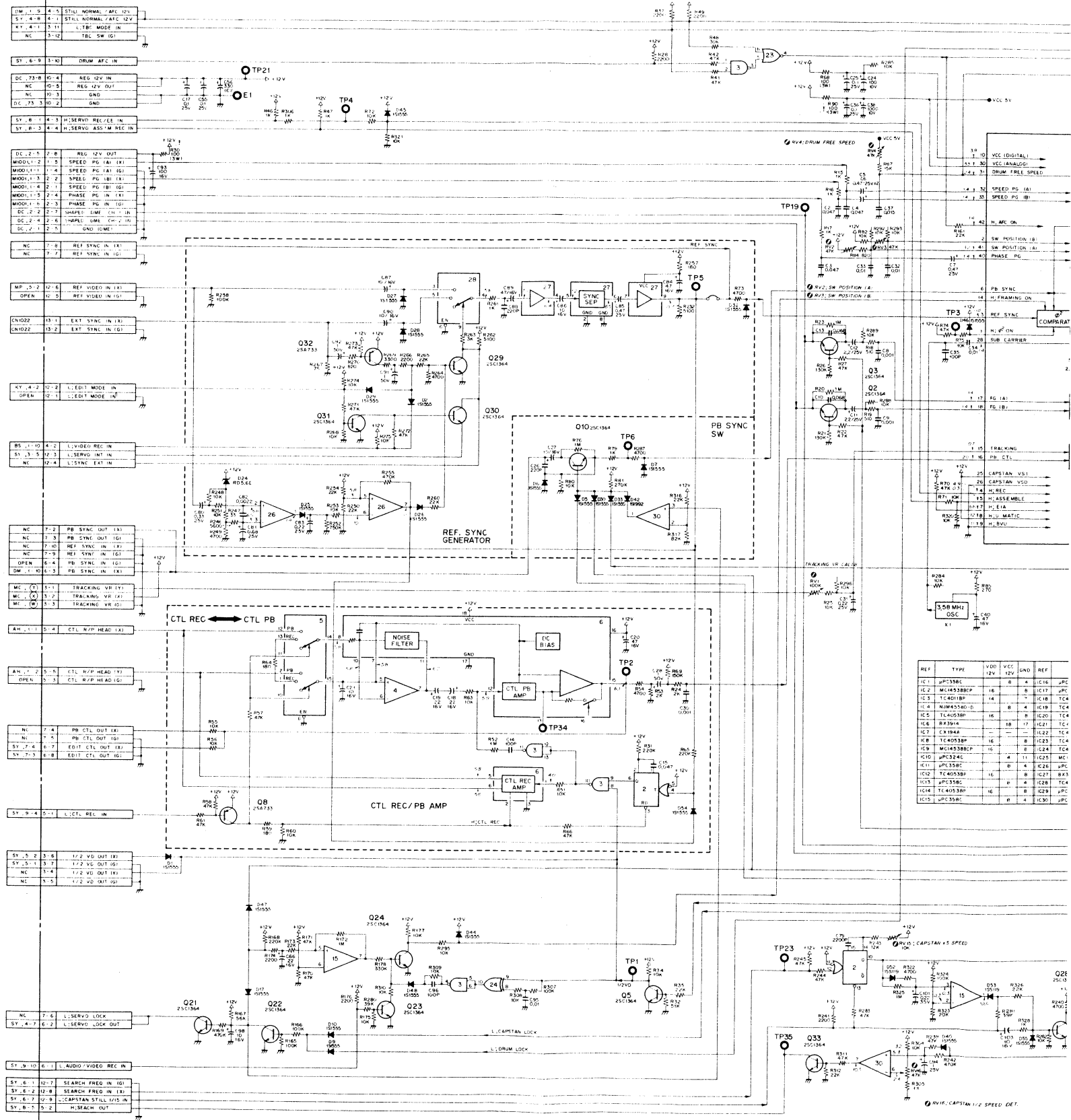
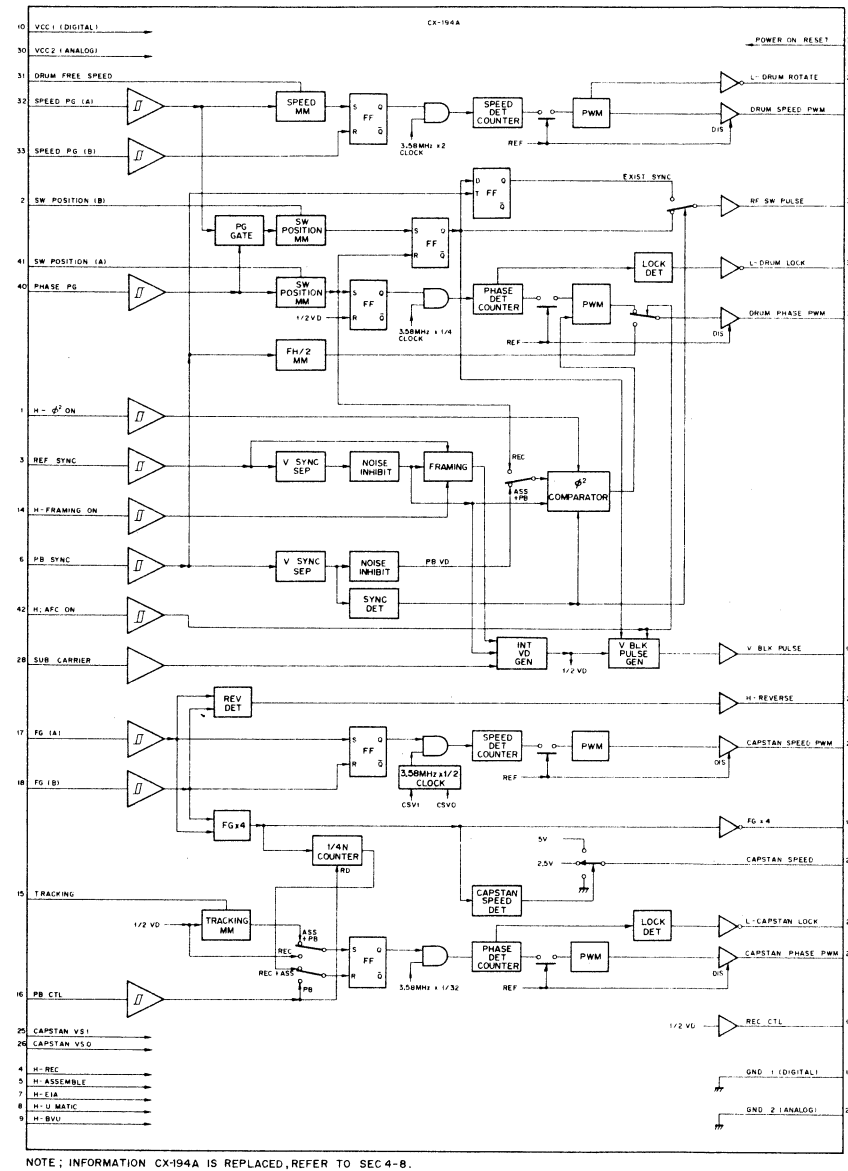
X1 E 2





SV-31 - SOLDERING SIDE -

S/N 10141 ~ 10440 (USA)
S/N 20011 ~ 20110 (CND)

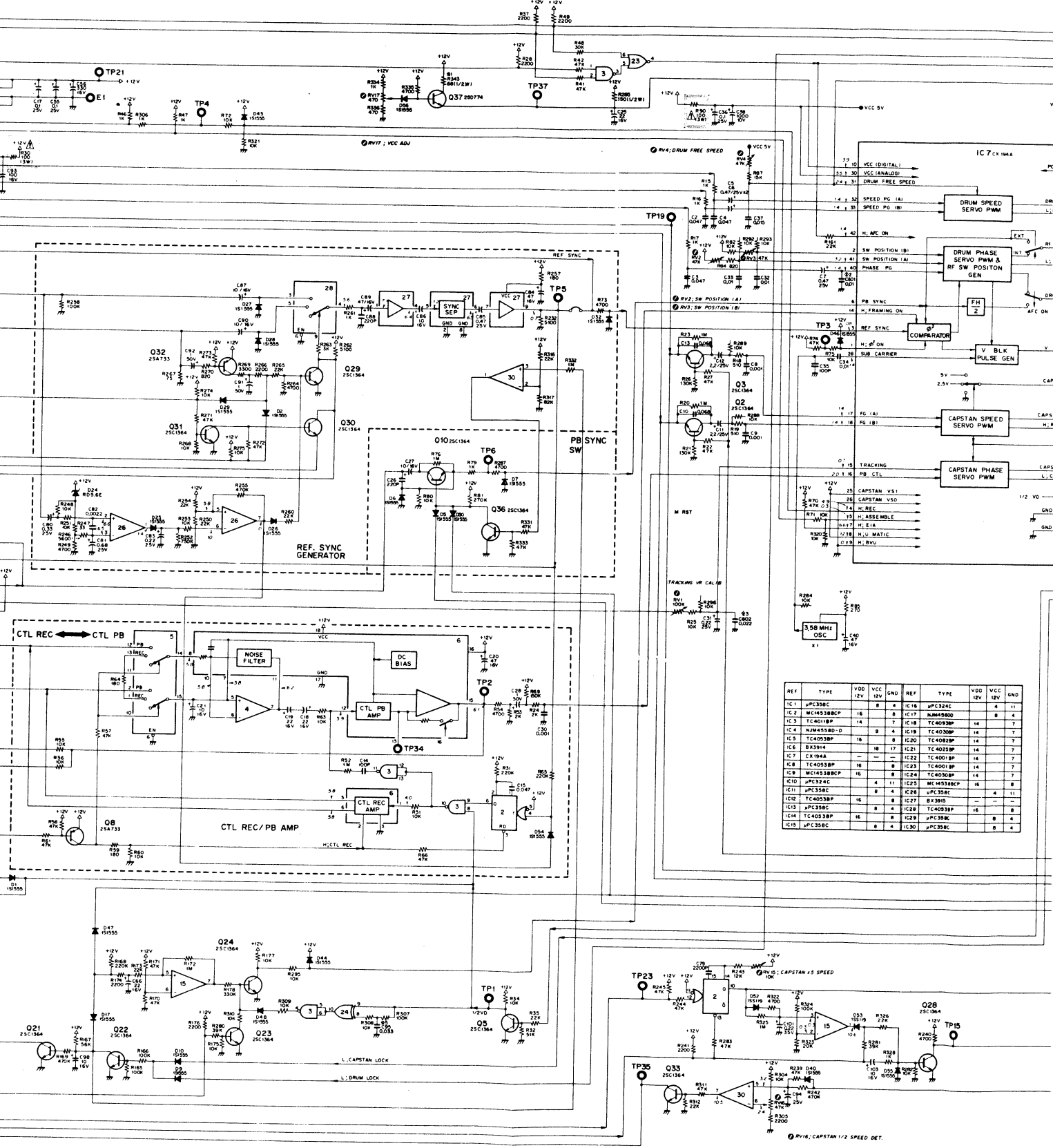
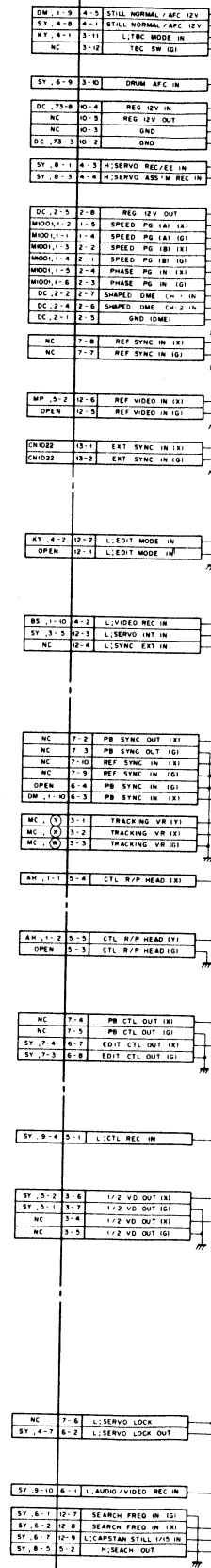
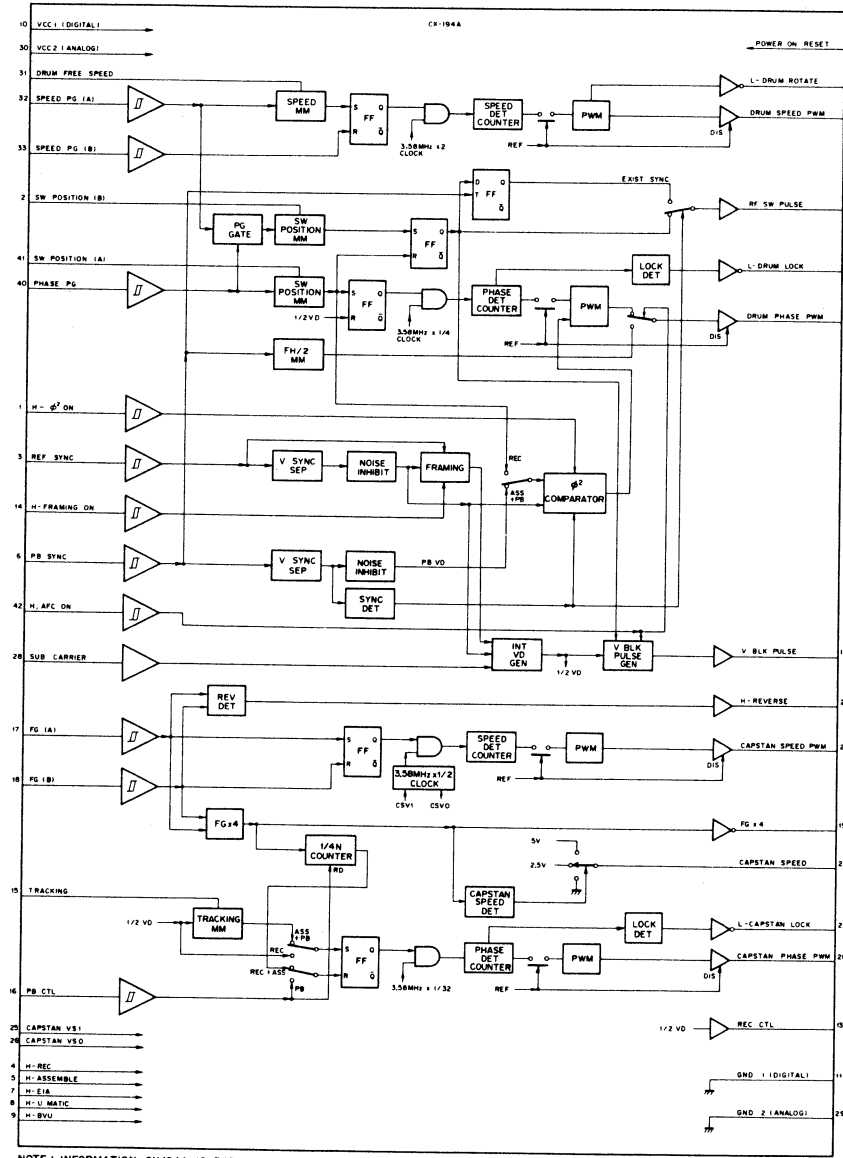


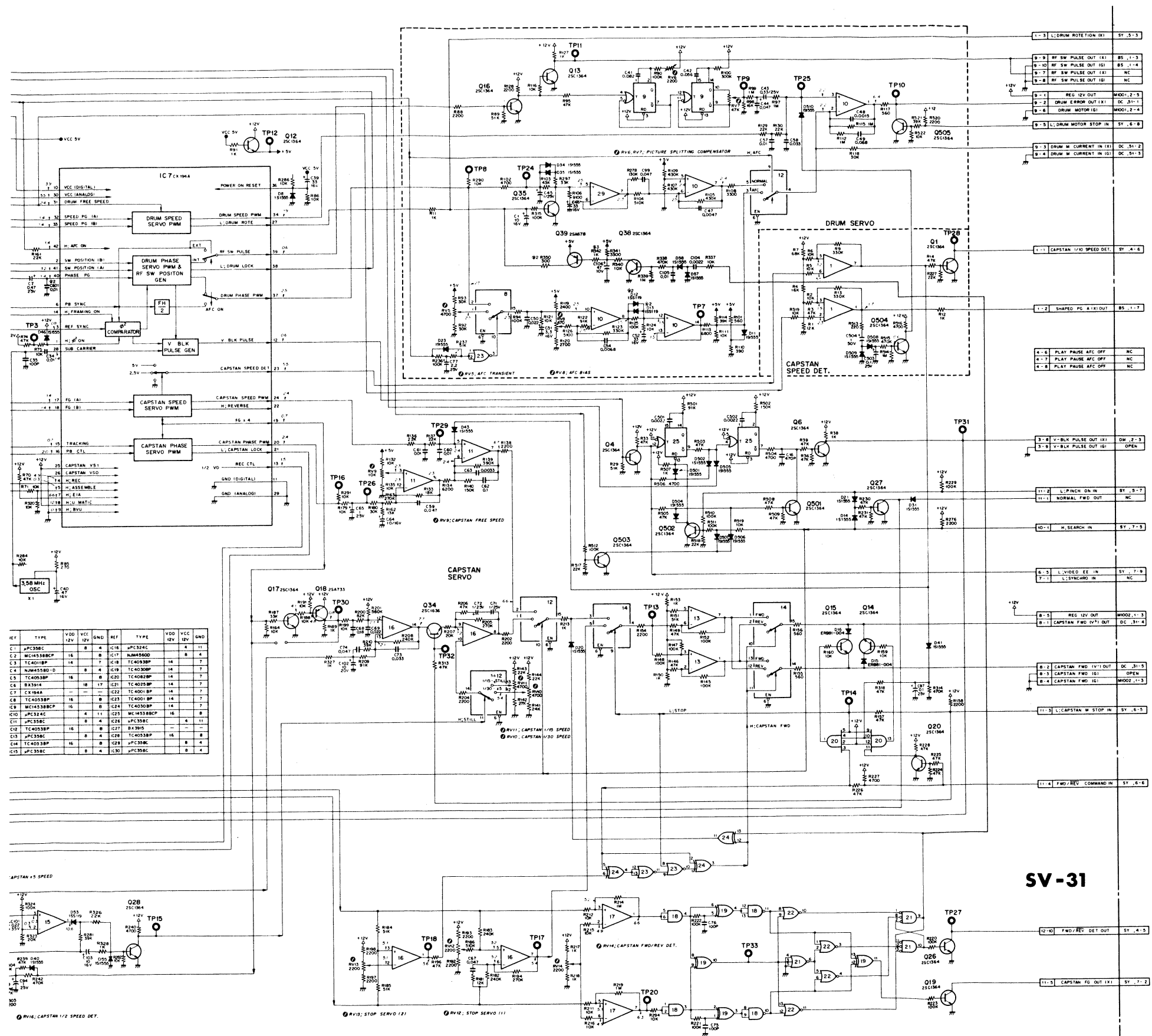


The shaded and -marked components are critical to safety.

Replace only with same components as specified.

S/N 10441 ~ 18910 (USA)
S/N 20111 ~ 20660 (CND)



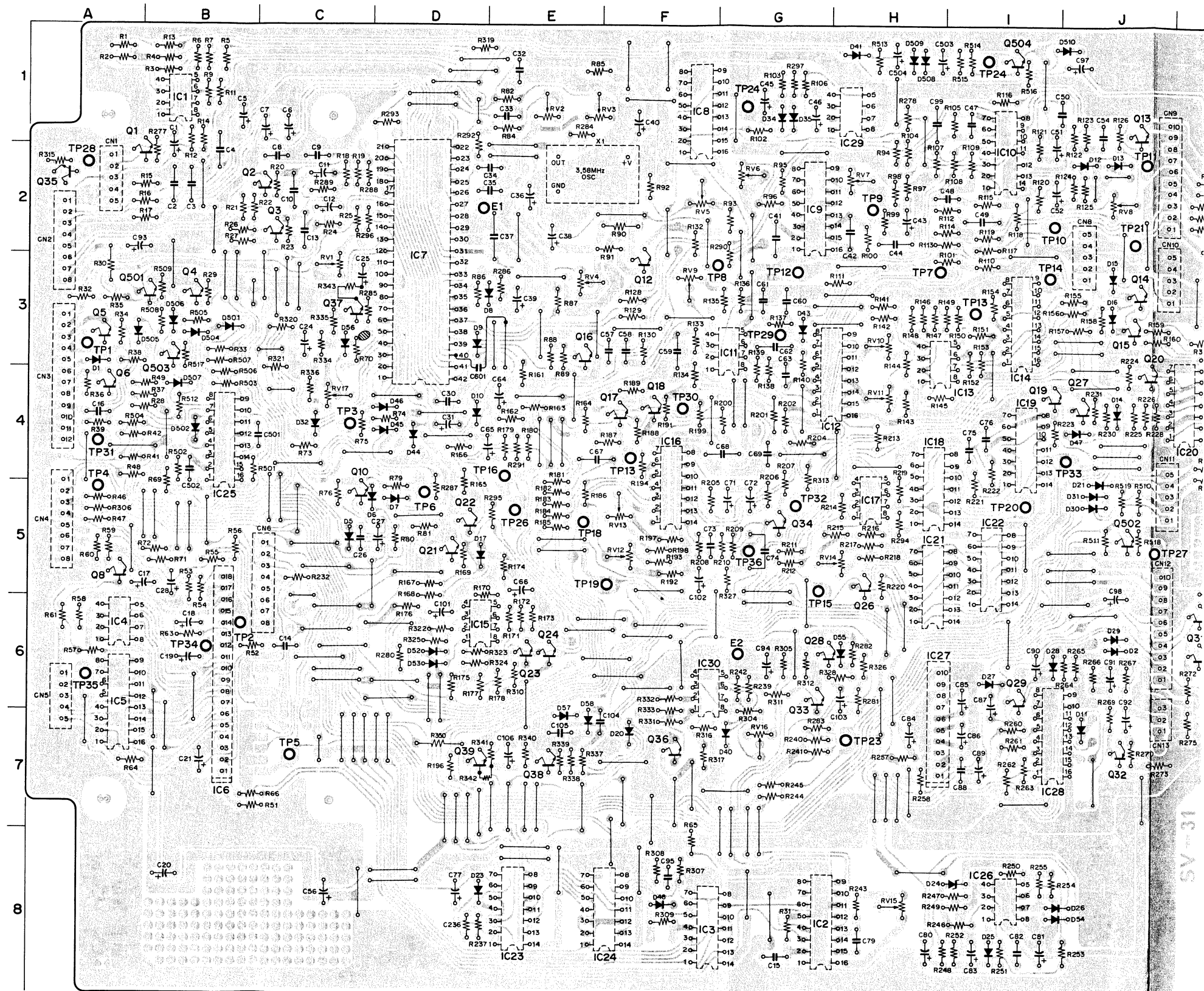


NOTE	CHANGE INFORMATION	SERIAL NO.
0-1	R343 6811Z/1ADDED	USA : 10091 : CND : 20111 : J : 10001 :
0-2	R360 300 ADDED DIA 010 :181925-181918 CND 001 ADDED	USA : 11891 : CND : 20201 : J : 10201 :
0-3	C602 0022 ADDED R342 1K ADDED	USA : 17791 : CND : 20211 : J : 10301 :
0-4	IC17 03C39C-14JAN4660	USA : 15691 : CND : 20211 : J : 10401 :
0-5	C95 001-0-033	USA : 15641 : CND : 20411 : J : 10501 :

NOTE: The shaded and -marked components are critical to safety.
Replace only with same components as specified.

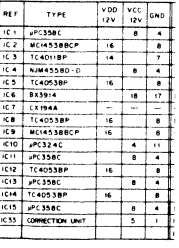
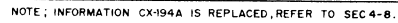
S/N 10141 ~ 18910 (USA)
S/N 20011 ~ 20660 (CND)

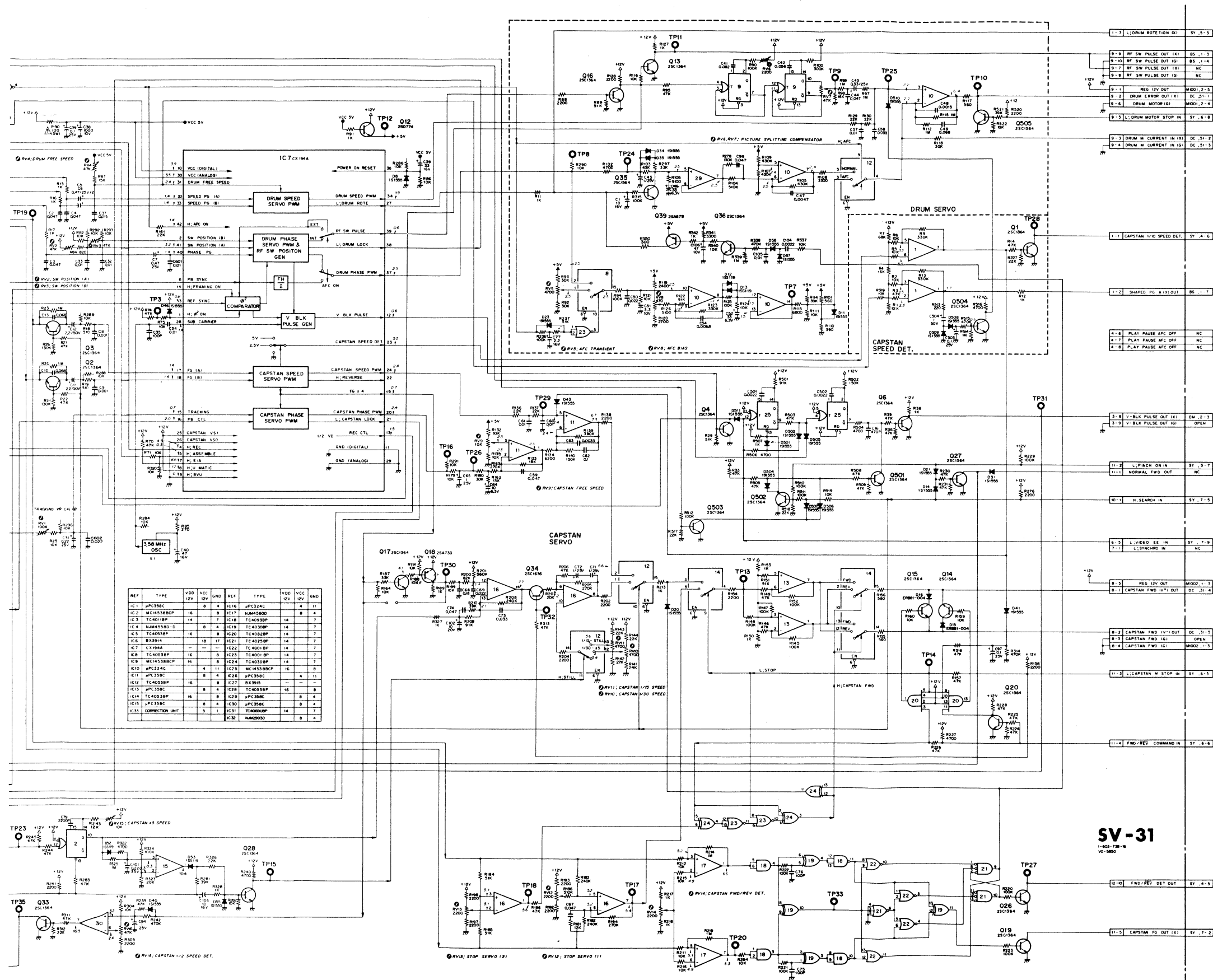
CN1	A-2	IC1	B-1	RV1	C-3
CN2	A-3	IC2	G-8	RV2	E-1
CN3	A-4	IC3	F-8	RV3	E-1
CN4	A-5	IC4	A-6	RV4	E-3
CN5	A-6	IC5	A-6	RV5	F-2
CN6	C-5	IC6	B-6	RV6	G-2
CN8	J-2	IC7	D-3	RV7	J-2
CN9	J-2	IC8	F-1	RV8	J-2
CN10	J-3	IC9	G-2	RV9	F-3
CN11	J-5	IC10	I-2	RV10	H-3
CN12	J-6	IC11	F-3	RV11	H-4
CN13	J-6	IC12	G-4	RV12	F-5
		IC13	H-3	RV13	F-5
D1	A-4	IC14	I-3	RV14	G-5
D2	J-6	IC15	D-6	RV15	H-8
D5	C-5	IC16	F-5	RV16	G-7
D6	C-5	IC17	H-5	RV17	C-4
D7	D-5	IC18	H-5		
D8	D-3	IC19	I-4	TP1	A-3
D9	D-3	IC20	K-4	TP2	B-6
D10	D-4	IC21	H-5	TP3	C-4
D11	J-7	IC22	H-5	TP4	A-5
D12	J-2	IC23	E-8	TP5	C-7
D13	J-2	IC24	F-8	TP6	D-5
D14	J-4	IC25	B-4	TP7	H-3
D15	J-3	IC26	I-8	TP8	F-3
D16	J-3	IC27	H-7	TP9	H-2
D17	D-5	IC28	I-7	TP10	I-2
D20	F-7	IC29	H-1	TP11	J-2
D21	J-5	IC30	F-6	TP12	G-3
D23	D-8			TP13	I-3
D24	I-8	Q1	A-2	TP14	I-3
D25	I-8	Q2	B-2	TP15	G-5
D26	I-8	Q3	C-2	TP16	E-5
D27	I-6	Q4	B-3	TP17	F-4
D28	I-6	Q5	A-3	TP18	E-5
D29	J-6	Q6	A-4	TP19	E-5
D30	J-5	Q8	A-5	TP20	I-5
D31	J-5	Q10	C-5	TP21	J-2
D32	C-4	Q12	F-3	TP23	H-7
D34	G-1	Q13	J-1	TP24	G-1
D35	G-1	Q14	J-3	TP25	I-1
D40	G-7	Q15	J-3	TP26	E-5
D41	H-1	Q16	E-3	TP27	J-5
D43	G-3	Q17	E-4	TP28	A-2
D44	D-4	Q18	F-4	TP29	G-3
D45	D-4	Q19	I-4	TP30	F-4
D46	D-4	Q20	J-4	TP31	A-4
D47	J-4	Q21	D-5	TP32	G-5
D48	F-8	Q22	D-5	TP33	I-4
D52	D-6	Q23	E-6	TP34	B-6
D53	D-6	Q24	E-6	TP35	A-6
D54	I-8	Q26	H-5	TP36	G-5
D55	H-6	Q27	J-4		
D56	C-3	Q28	G-6		
D57	E-7	Q29	I-6		
D58	E-7	Q30	K-6		
D501	B-3	Q31	K-6		
D502	B-4	Q32	J-7		
D504	B-3	Q33	G-6		
D505	A-3	Q34	G-5		
D506	B-3	Q35	A-2		
D508	H-1	Q36	F-7		
D509	H-1	Q37	C-3		
D510	I-1	Q38	E-7		
		Q39	D-7		
E1	D-2	Q501	A-3		
E2	G-6	Q502	J-5		
		Q503	B-3		
		Q504	I-1		
		Q505	K-2		





S/N 18911 AND LATER (USA)
S/N 20661 AND LATER (CND)

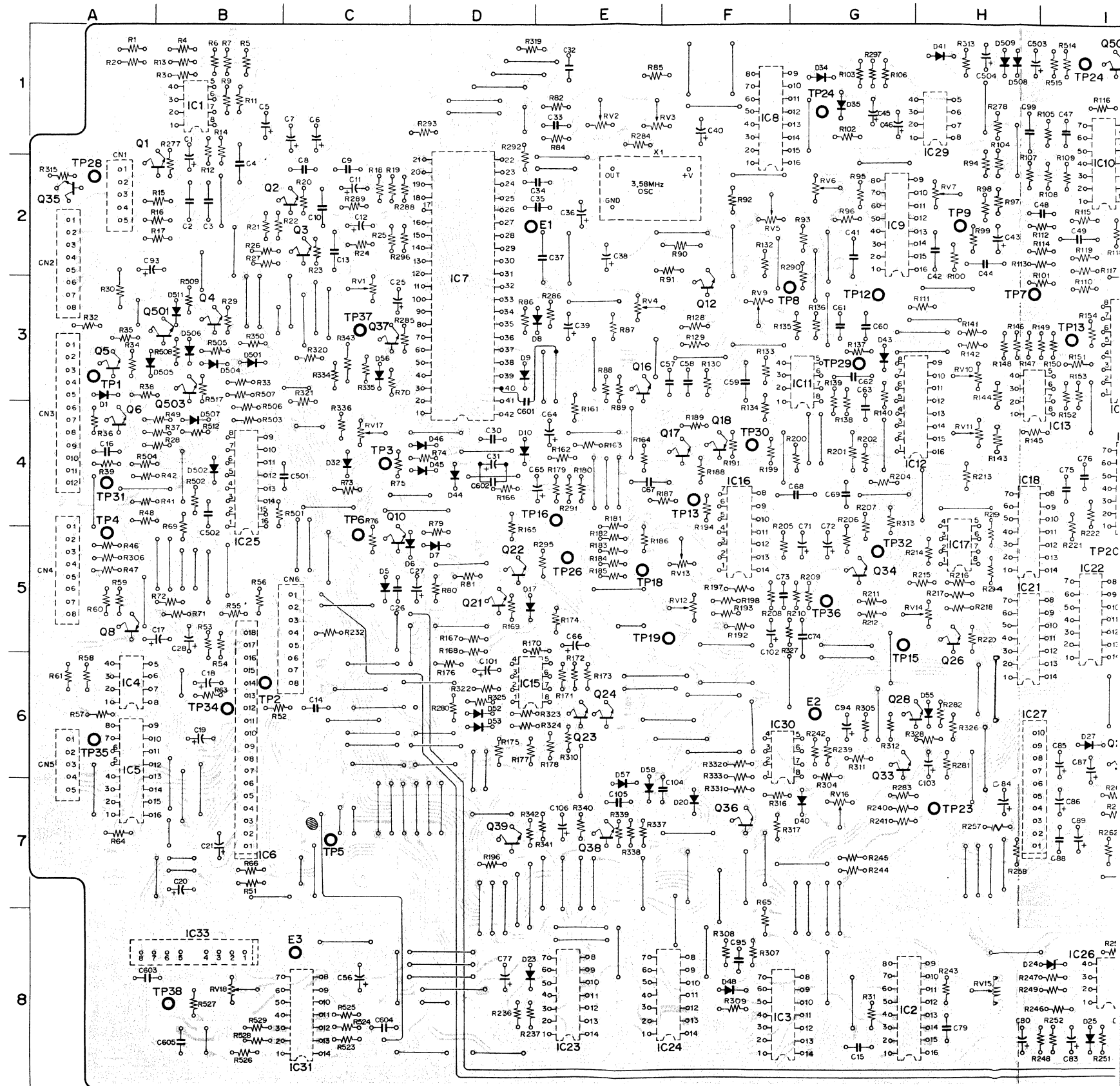


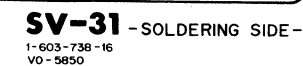


NOTE: The shaded and Δ -marked components are critical to safety. Replace only with same components as specified.

S/N 18911 AND LATER (USA)
S/N 20661 AND LATER (CND)

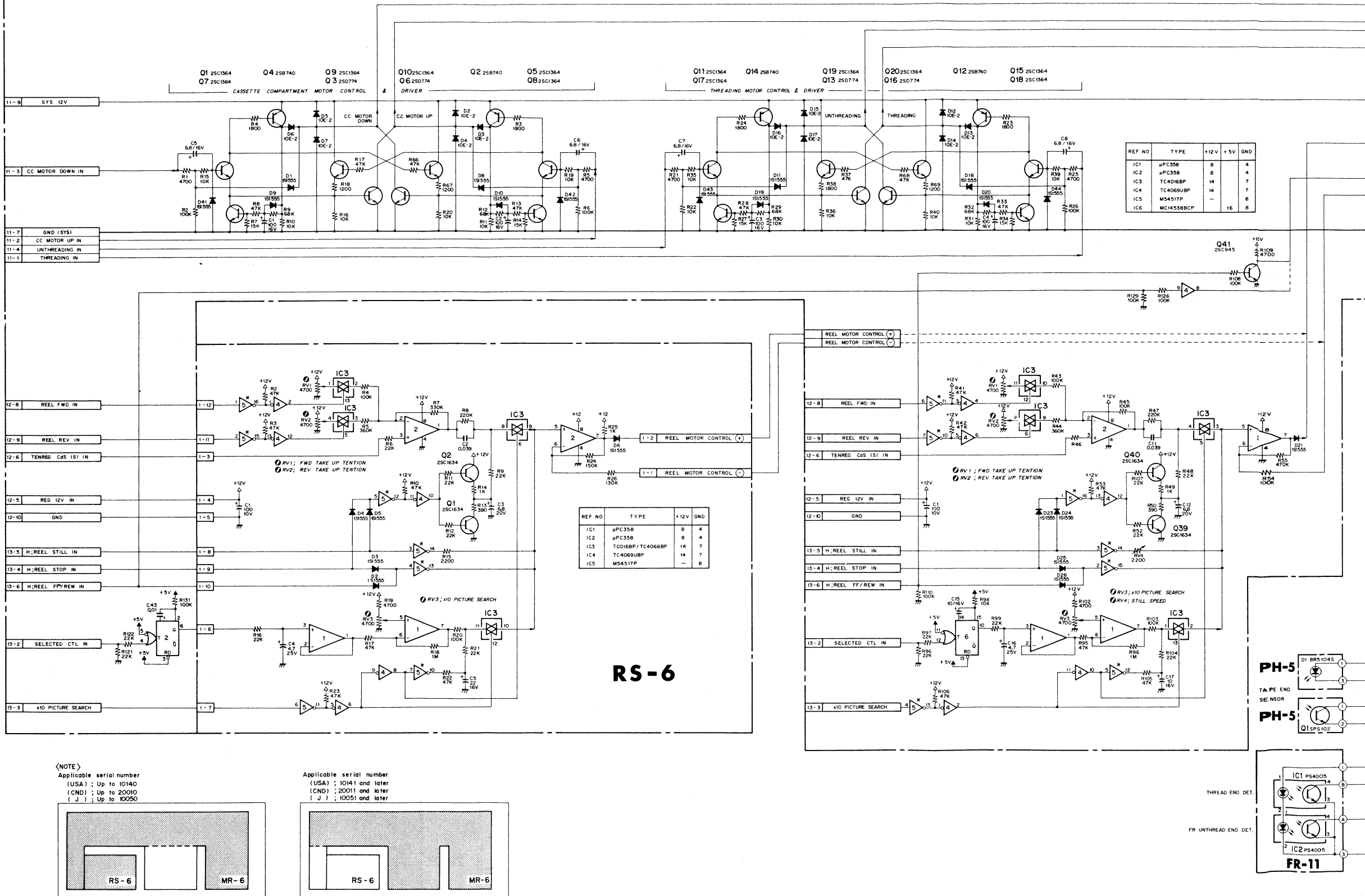
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CN4	A-5	IC4	A-6	RV4	E-3
CN5	A-6	IC5	A-6	RV5	F-2
CN6	C-5	IC6	B-6	RV6	G-2
CN8	J-2	IC7	D-3	RV7	H-2
CN9	J-2	IC8	F-1	RV8	J-2
CN10	J-3	IC9	G-2	RV9	F-3
CN11	J-5	IC10	I-2	RV10	H-3
CN12	J-6	IC11	F-3	RV11	H-4
CN13	J-6	IC12	G-4	RV12	F-5
		IC13	H-3	RV13	F-5
		IC14	I-3	RV14	G-5
D1	A-4	IC15	D-6	RV15	H-8
D2	J-6	IC16	F-5	RV16	G-7
D5	C-5	IC17	H-5	RV17	C-4
D6	C-5	IC18	H-5	RV18	B-8
D7	D-5	IC19	I-4		
D8	D-3	IC20	K-4	TP1	A-3
D9	D-3	IC21	H-5	TP2	B-6
D10	D-4	IC22	H-5	TP3	C-4
D11	J-7	IC23	E-8	TP4	A-5
D12	J-2	IC24	F-8	TP5	C-7
D13	J-2	IC25	B-4	TP6	C-5
D14	J-4	IC26	I-8	TP7	H-3
D15	J-3	IC27	H-7	TP8	F-3
D16	J-3	IC28	I-7	TP9	H-2
D17	D-5	IC29	H-1	TP10	I-2
D20	F-7	IC30	F-6	TP11	J-2
D21	J-5	IC31	C-8	TP12	G-3
D23	D-8	IC32	K-5	TP13	I-3
D24	I-8	IC33	B-8	TP14	I-3
D25	I-8			TP15	G-5
D26	I-8			TP16	E-5
D27	I-6	Q1	A-2	TP17	F-4
D28	I-6	Q2	B-2	TP18	E-5
D29	J-6	Q3	C-2	TP19	E-5
D30	J-5	Q4	B-3	TP20	I-5
D31	J-5	Q5	A-3	TP21	J-2
D32	C-4	Q6	A-4	TP22	H-7
D34	G-1	Q8	A-5	TP23	H-7
D35	G-1	Q10	C-5	TP24	G-1
D40	G-7	Q12	F-3	TP25	I-1
D41	H-1	Q13	J-1	TP26	E-5
D43	G-3	Q14	J-3	TP27	J-5
D44	D-4	Q15	J-3	TP28	A-2
D45	D-4	Q16	E-3	TP29	G-3
D46	D-4	Q17	E-4	TP30	F-4
D47	J-4	Q18	F-4	TP31	A-4
D48	F-8	Q19	I-4	TP32	G-5
D52	D-6	Q20	J-4	TP33	I-4
D53	D-6	Q21	D-5	TP34	B-6
D54	I-8	Q22	D-5	TP35	A-6
D55	H-6	Q23	E-6	TP36	G-5
D56	C-3	Q24	E-6	TP37	C-3
D57	E-7	Q26	H-5	TP38	B-8
D58	E-7	Q27	J-4		
D501	B-3	Q28	G-6	X1	E-2
D502	B-4	Q29	I-6		
D504	B-3	Q30	K-6		
D505	A-3	Q31	K-6		
D506	B-3	Q32	J-7		
D508	H-1	Q33	G-6		
D509	H-1	Q34	G-5		
D510	I-1	Q35	A-2		
D511	B-3	Q36	F-7		
		Q37	C-3		
E1	D-2	Q38	E-7		
E2	G-6	Q39	D-7		
E3	C-8	Q501	B-3		
		Q502	J-5		
		Q503	B-3		
		Q504	I-1		
		Q505	K-2		

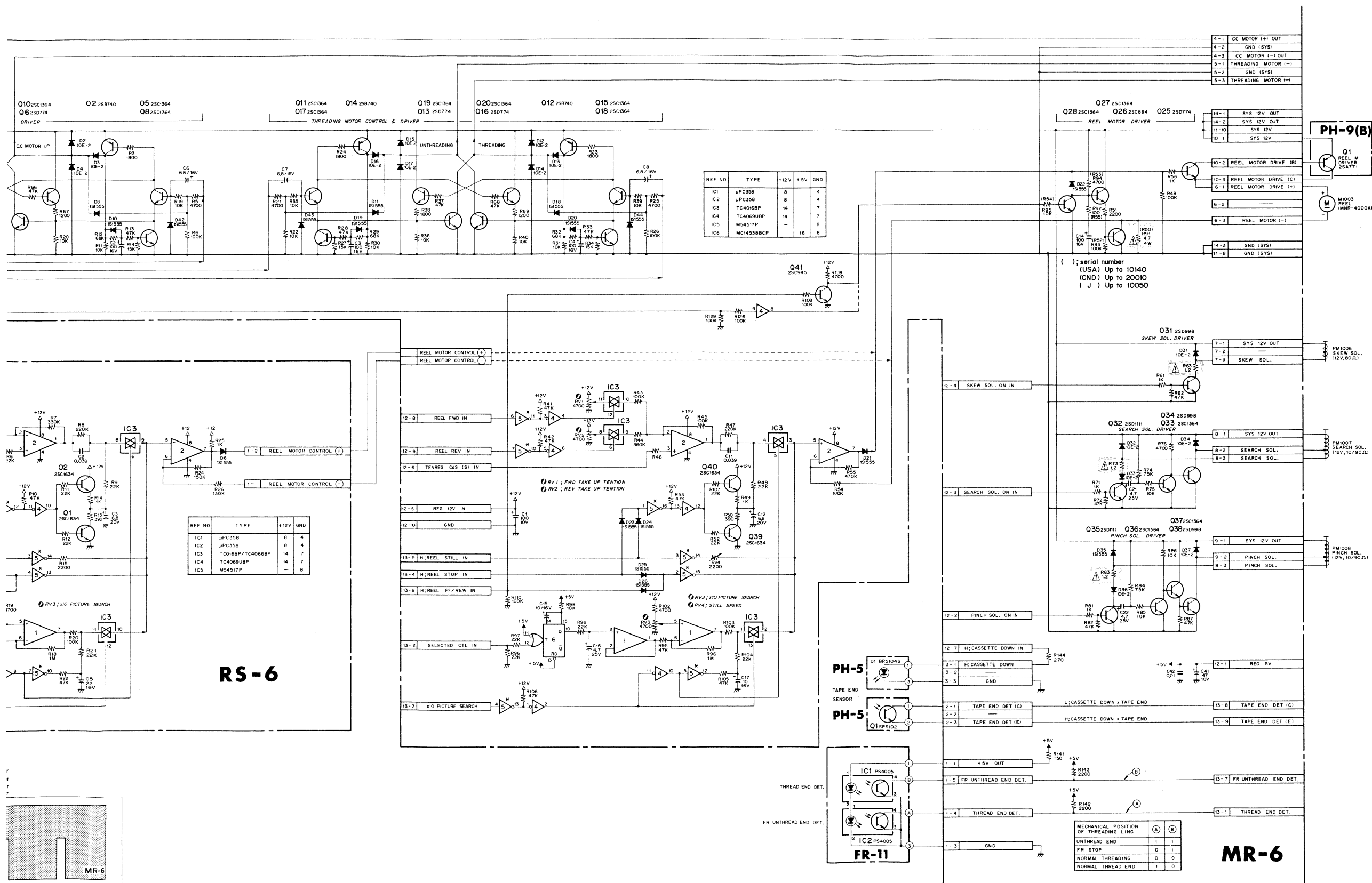




MR-6 (THREADING / CC MOTOR DRIVER)
RS-6 (REEL MOTOR SERVO)
FR-11
PH-5
PT-9

S/N UP TO 10440 (USA)
S/N UP TO 20110 (CND)



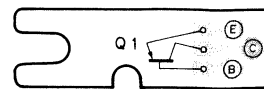


NOTE:

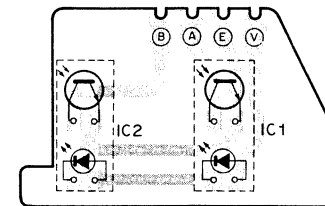
The shaded and Δ -marked components are critical to safety.
Replace only with same components as specified.

MR-6 (THREADING / CC MOTOR DRIVER)
RS-6 (REEL MOTOR SERVO)
FR-11
PH-5
PT-9

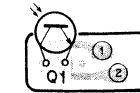
S/N UP TO 10140 (USA)
S/N UP TO 20010 (CND)



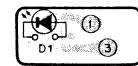
PT-9
- SOLDERING SIDE -



FR-11 - SOLDERING SIDE -

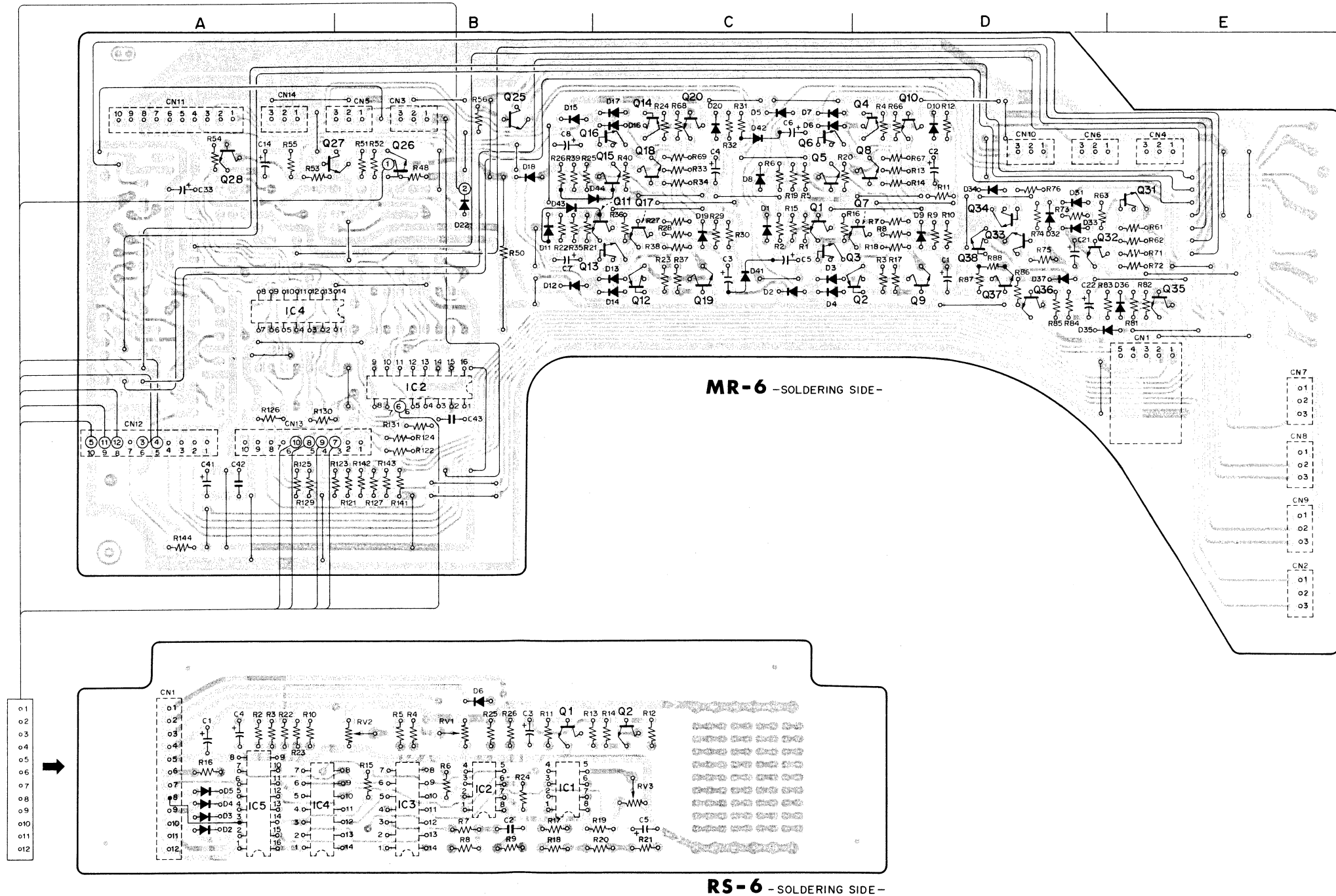


PH-5
- SOLDERING SIDE -



PH-5
- SOLDERING SIDE -

CN1	E - 3	D41	C - 2
CN2	E - 3	D42	C - 1
CN3	B - 1	D43	B - 1
CN4	E - 1	D44	C - 1
CN5	B - 1		
CN6	D - 1	IC2	B - 3
CN7	E - 3	IC4	A - 2
CN8	E - 3		
CN9	E - 3	Q1	C - 1
CN10	D - 1	Q2	D - 2
CN11	A - 1	Q3	C - 2
CN12	A - 3	Q4	D - 1
CN13	A - 3	Q5	C - 1
CN14	A - 1	Q6	C - 1
		Q7	D - 1
D1	C - 1	Q8	D - 1
D2	C - 2	Q9	D - 2
D3	C - 2	Q10	D - 1
D4	C - 2	Q11	C - 1
D5	C - 1	Q12	C - 2
D6	C - 1	Q13	C - 2
D7	C - 1	Q14	C - 1
D8	C - 1	Q15	C - 1
D9	D - 1	Q16	C - 1
D10	D - 1	Q17	C - 1
D13	C - 2	Q18	C - 1
D14	C - 2	Q19	C - 2
D15	B - 1	Q20	C - 1
D16	C - 1	Q25	B - 1
D17	C - 1	Q26	B - 1
D18	B - 1	Q27	A - 1
D19	C - 1	Q28	A - 1
D20	C - 1	Q31	E - 1
D22	B - 1	Q32	D - 2
D31	D - 1	Q33	D - 2
D32	D - 1	Q34	D - 1
D33	D - 1	Q35	E - 2
D35	E - 2	Q36	D - 2
D36	E - 2	Q37	D - 2
D37	D - 2	Q38	D - 2



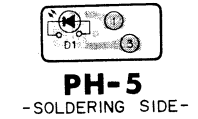
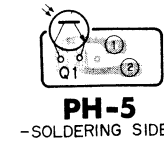
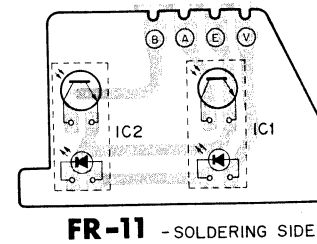
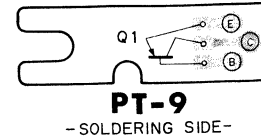
MR-6 (THREADING / CC MOTOR DRIVER / REEL MOTOR SERVO)

FR-11

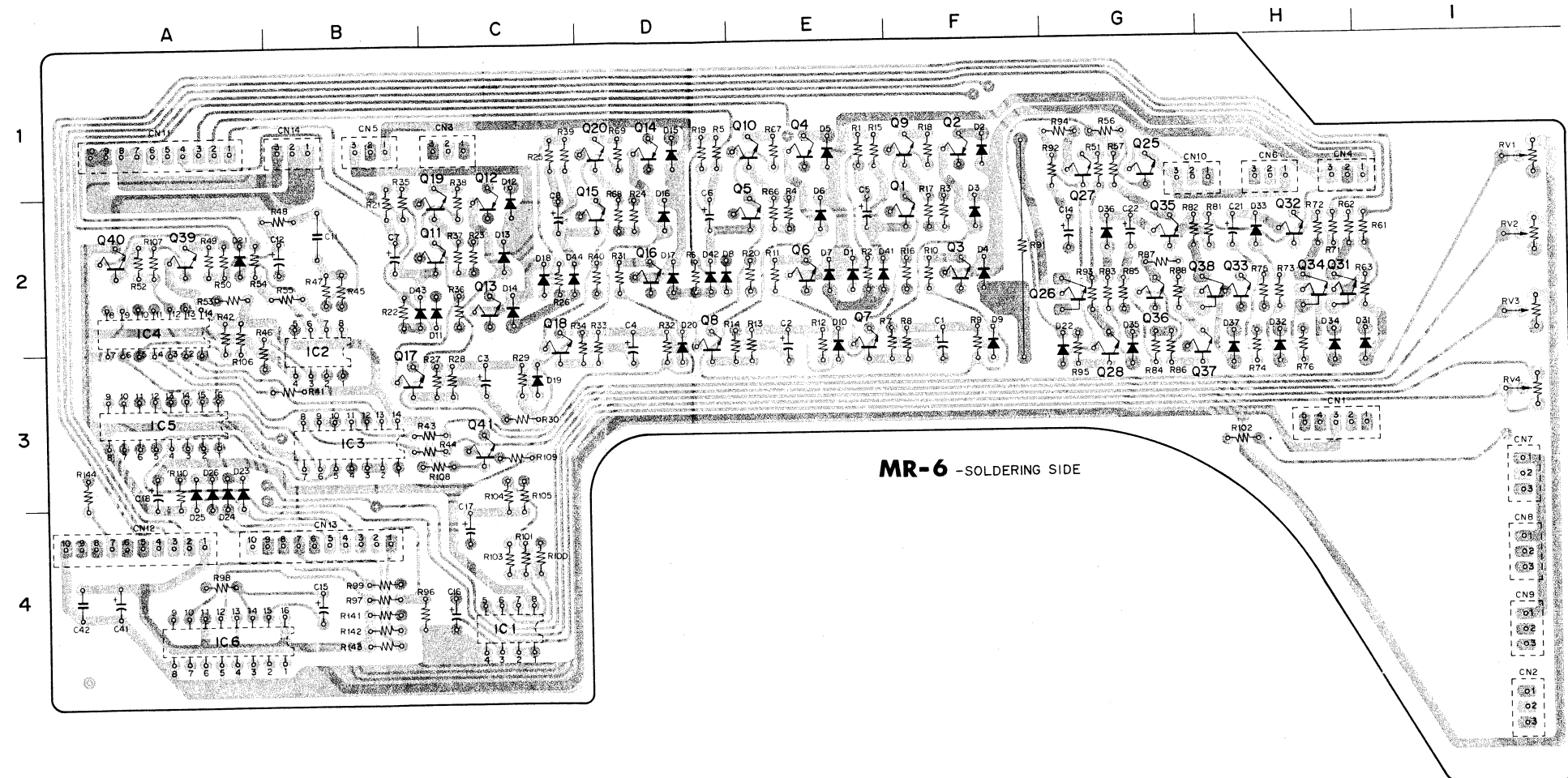
PH-5

PT-9

S/N 10141 ~ 10440 (USA)
S/N 20011 ~ 20110 (CND)



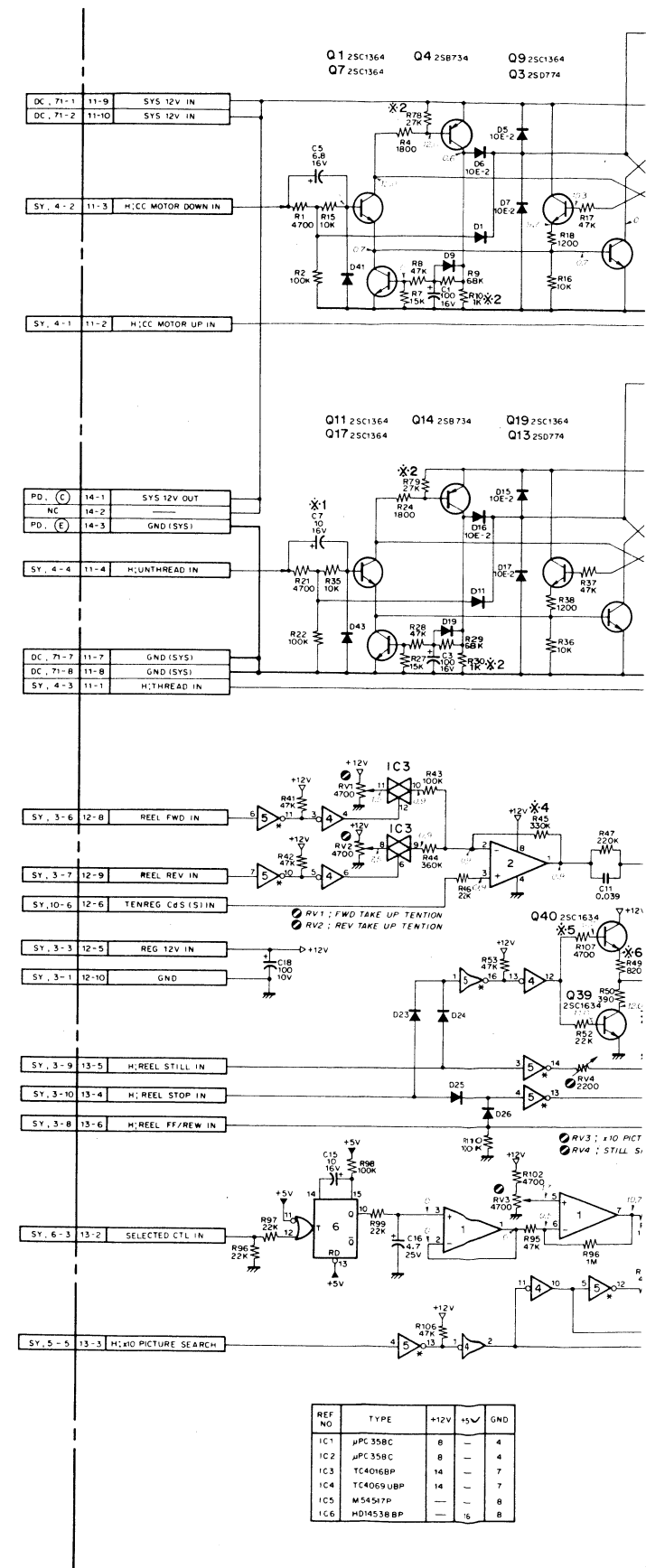
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CN2	I-4	D22	G-2	Q12	C-2
CN3	C-1	D23	A-3	Q13	C-2
CN4	H-1	D24	A-3	Q14	D-1
CN5	B-1	D25	A-3	Q15	D-2
CN6	H-1	D26	A-3	Q16	D-2
CN7	I-3	D31	I-2	Q17	B-3
CN8	I-4	D32	H-2	Q18	C-2
CN9	I-4	D33	H-2	Q19	C-2
CN10	H-1	D34	H-2	Q20	D-1
CN11	A-1	D35	G-2	Q25	G-1
CN12	A-4	D36	G-2	Q26	G-2
CN13	B-4	D37	H-2	Q27	G-1
CN14	B-1	D41	E-2	Q28	G-2
		D42	D-2	Q31	H-2
		D43	B-2	Q32	H-2
		D44	C-2	Q33	H-2
				Q34	H-2
				Q35	G-2
				Q36	G-2
				Q37	H-2
				Q38	H-2
				Q39	A-2
				Q40	A-2
				Q41	C-3
D1	E-2	Q1	F-2	RV1	I-1
D2	F-1	Q2	F-1	RV2	I-2
D3	F-2	Q3	F-2	RV3	I-2
D4	F-2	Q4	E-1	RV4	I-3
D5	E-1	Q5	E-2		
D6	E-2	Q6	E-2		
D7	E-2	Q7	E-2		
D8	D-2	Q8	D-2		
D9	F-2	Q9	F-1		
D10	E-2	Q10	E-1		
D11	C-2				
D12	C-2				
D13	C-2				
D14	C-2				
D15	D-1				
D16	D-2				
D17	D-2				
D18	C-2				
D19	C-3				
D20	D-2				



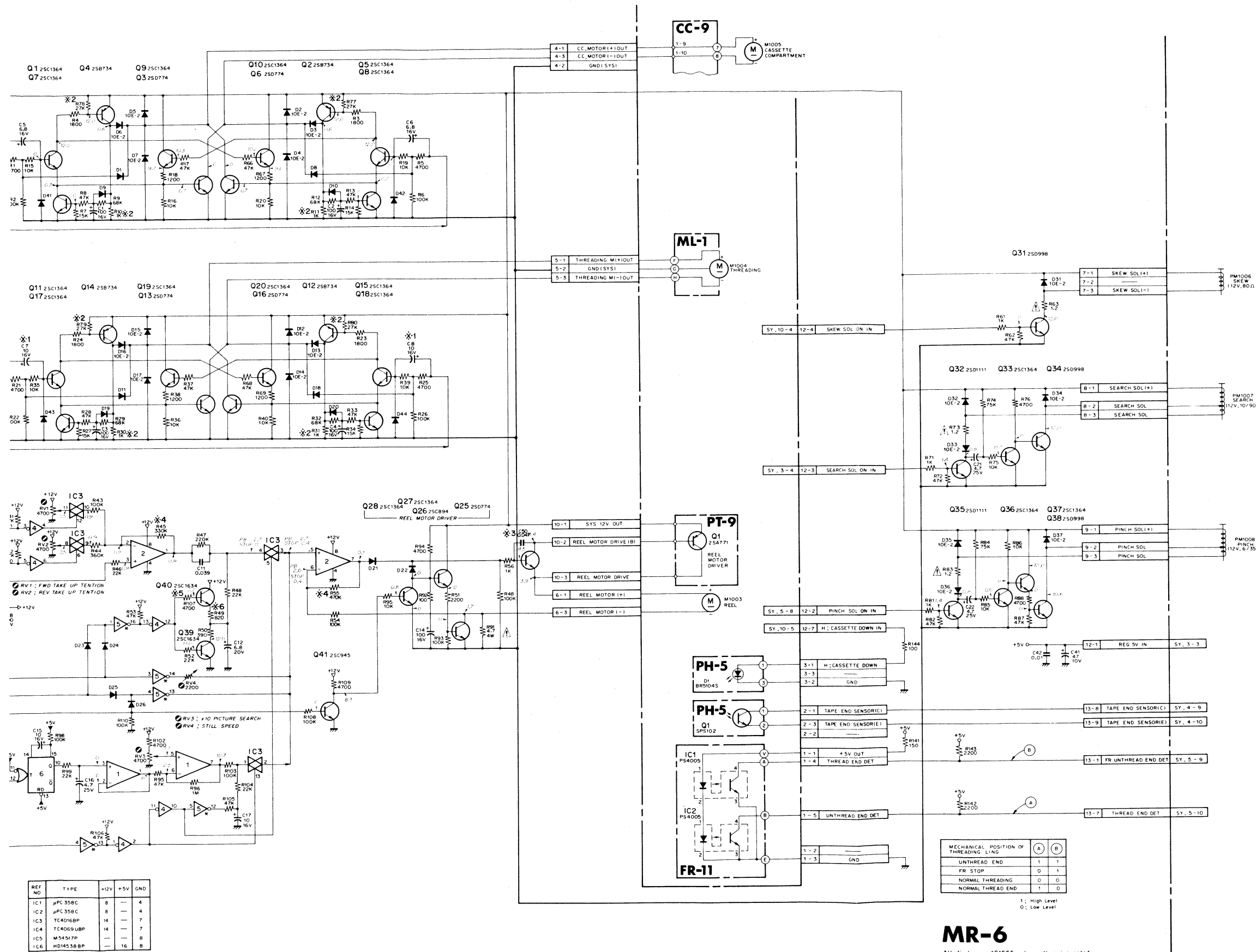
MR-6/FR-11/PH-5/PT-9

MR-6 (THREADING/CC MOTOR DRIVER)
FR-11 (THREADING RING DET.)
PH-5
PT-9

S/N 10441 ~ 19910 (USA)
S/N 20111 ~ 20710 (CND)



NOTE		
MARK	CHANGE INFORMATION	SERIAL NO.
※ 1	C7, C8 6.8 16V ▶ 10 16V	USA 10441 CND 20111 J 10051
※ 2	R10 R11 R30 R31 R77 R78 R79 R80 } 10K ▶ 1K } 27K ADDED	USA 10891 CND 20111 J 10101
※ 3	C50 0.047 ADDED	USA 13891 CND 20261 J 10551
※ 4	R45 100K ▶ 330K R55 470K ▶ 150K	USA 15541 CND 20441 J 10851
※ 5	R107 22K ▶ 4700	USA 15941 CND 20611 J 11051
※ 6	R49 1K ▶ 820	USA 16211 CND 20611 J 11151



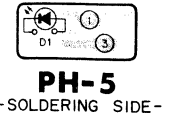
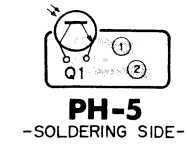
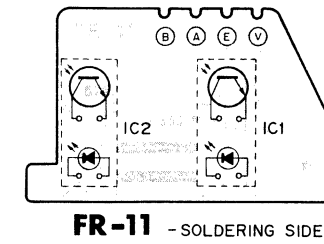
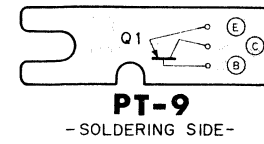
MR-6

All diodes are 1S1555 unless otherwise noted

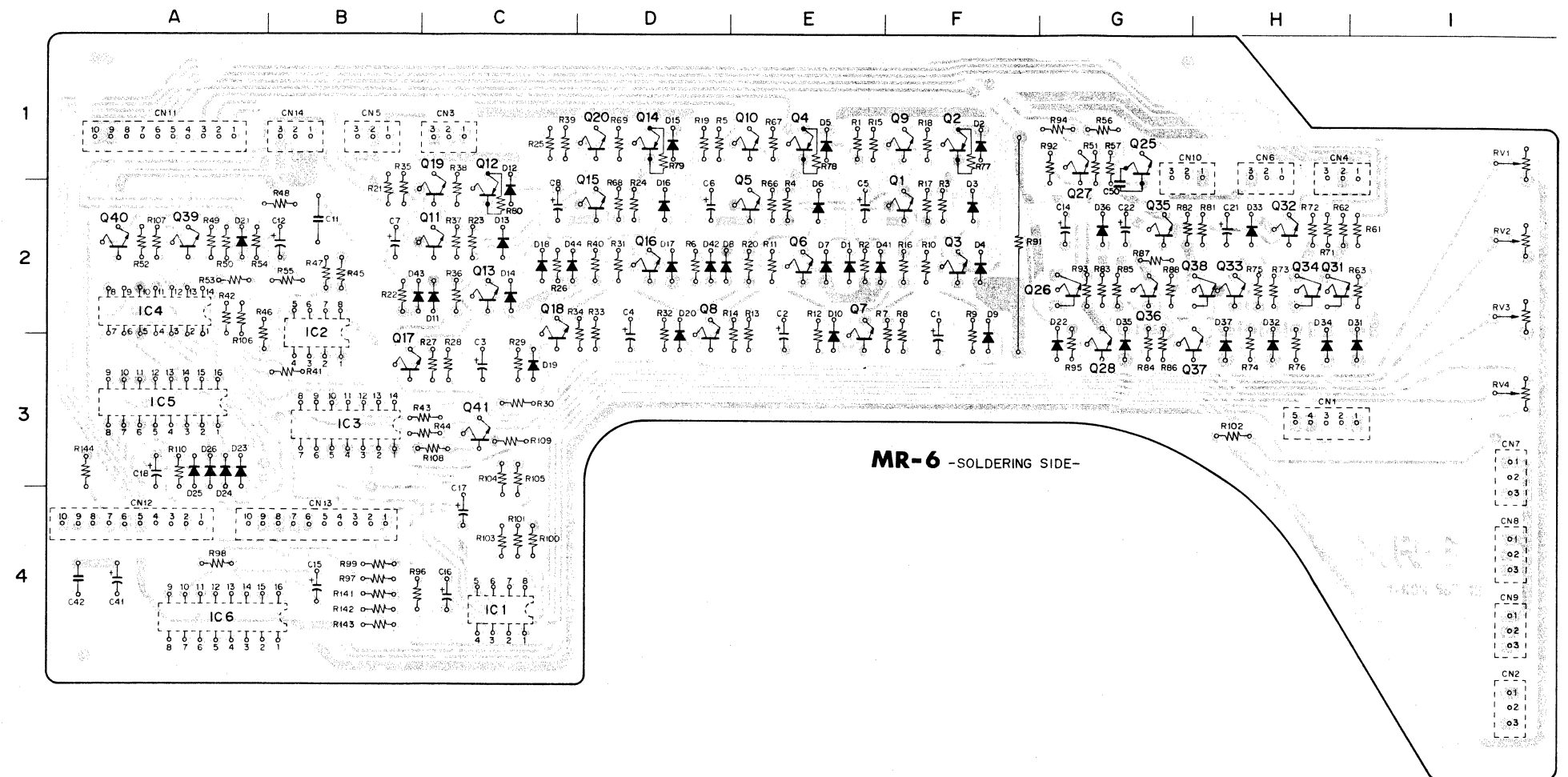
NOTE: The shaded and ⚠-marked components are critical to safety. Replace only with same components as specified.

MR-6 (THREADING / CC MOTOR DRIVER / REEL MOTOR SERVO)

S/N 10441 ~ 19910 (USA)
S/N 20111 ~ 20710 (CND)

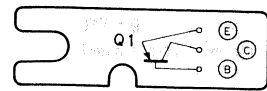


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CN2	I-4	D22	G-2	Q13	C-2
CN3	C-1	D23	A-3	Q14	D-1
CN4	H-1	D24	A-3	Q15	D-2
CN5	B-1	D25	A-3	Q16	D-2
CN6	H-1	D26	A-3	Q17	B-3
CN7	I-3	D31	I-2	Q18	C-2
CN8	I-4	D32	H-2	Q19	C-2
CN9	I-4	D33	H-2	Q20	D-1
CN10	H-1	D34	H-2	Q25	G-1
CN11	A-1	D35	G-2	Q26	G-2
CN12	A-4	D36	G-2	Q27	G-1
CN13	B-4	D37	H-2	Q28	G-2
CN14	B-1	D41	E-2	Q31	H-2
D1	E-2	D42	D-2	Q32	H-2
D2	F-1	D43	B-2	Q33	H-2
D3	F-2	D44	C-2	Q34	H-2
D4	F-2			Q35	G-2
D5	E-1	IC1	C-4	Q36	G-2
D6	E-2	IC2	B-2	Q37	H-2
D7	E-2	IC3	B-3	Q38	H-2
D8	D-2	IC4	A-2	Q39	A-2
D9	F-2	IC5	A-3	Q40	A-2
D10	E-2			Q41	C-3
D11	C-2	Q1	F-1	RV1	I-1
D12	C-2	Q2	F-1	RV2	I-2
D13	C-2	Q3	F-2	RV3	I-2
D14	C-2	Q4	E-1	RV4	I-3
D15	D-1	Q5	E-2		
D16	D-2	Q6	E-2		
D17	D-2	Q7	E-2		
D18	C-2	Q8	D-2		
D19	C-3	Q9	F-1		
D20	D-2	Q10	E-1		
		Q11	C-2		

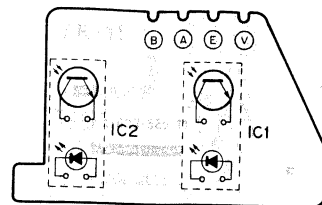


MR-6

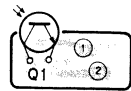
MR-6



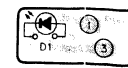
PT-9
-SOLDERING SIDE-



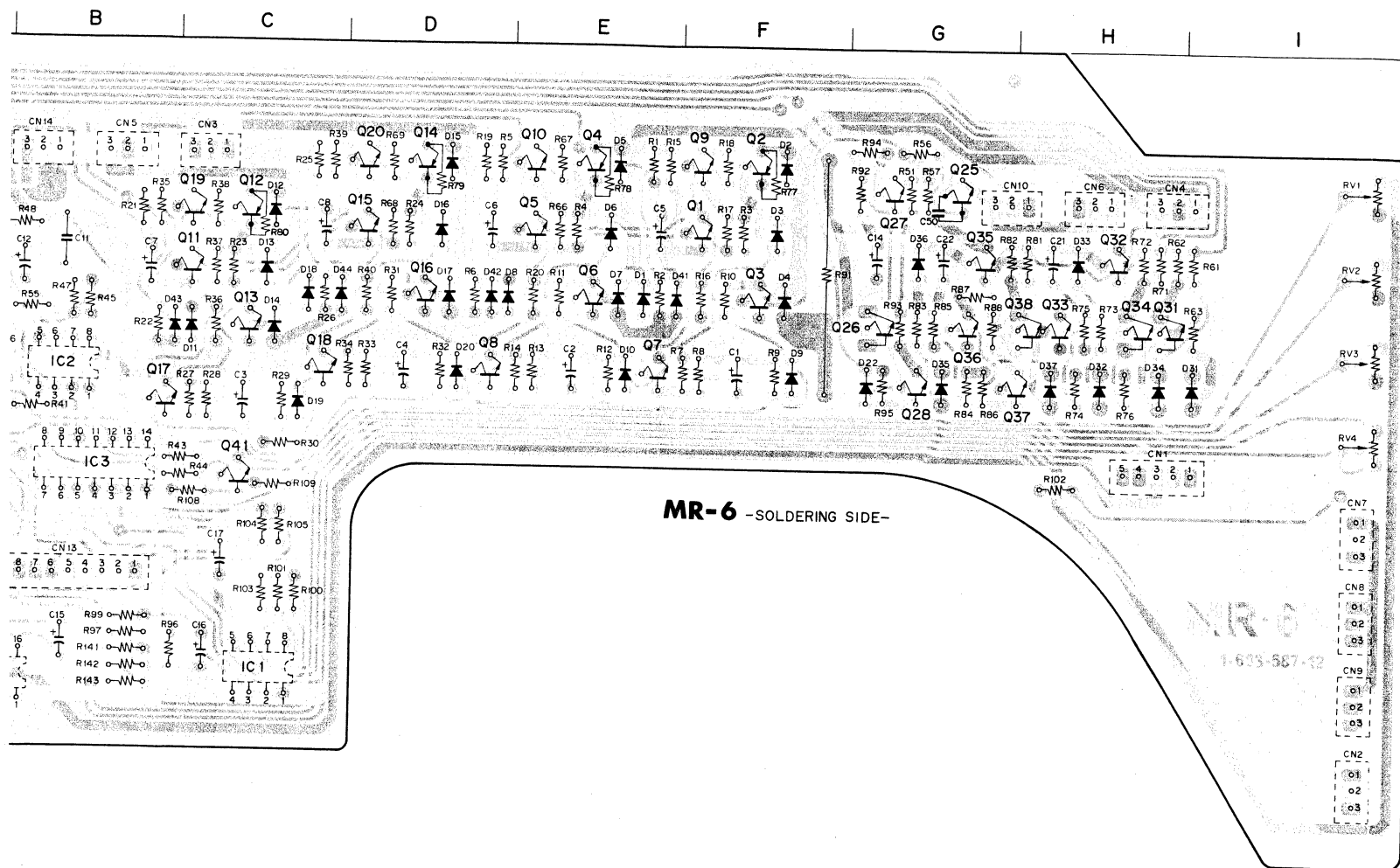
FR-11 -SOLDERING SIDE-



PH-5
-SOLDERING SIDE-



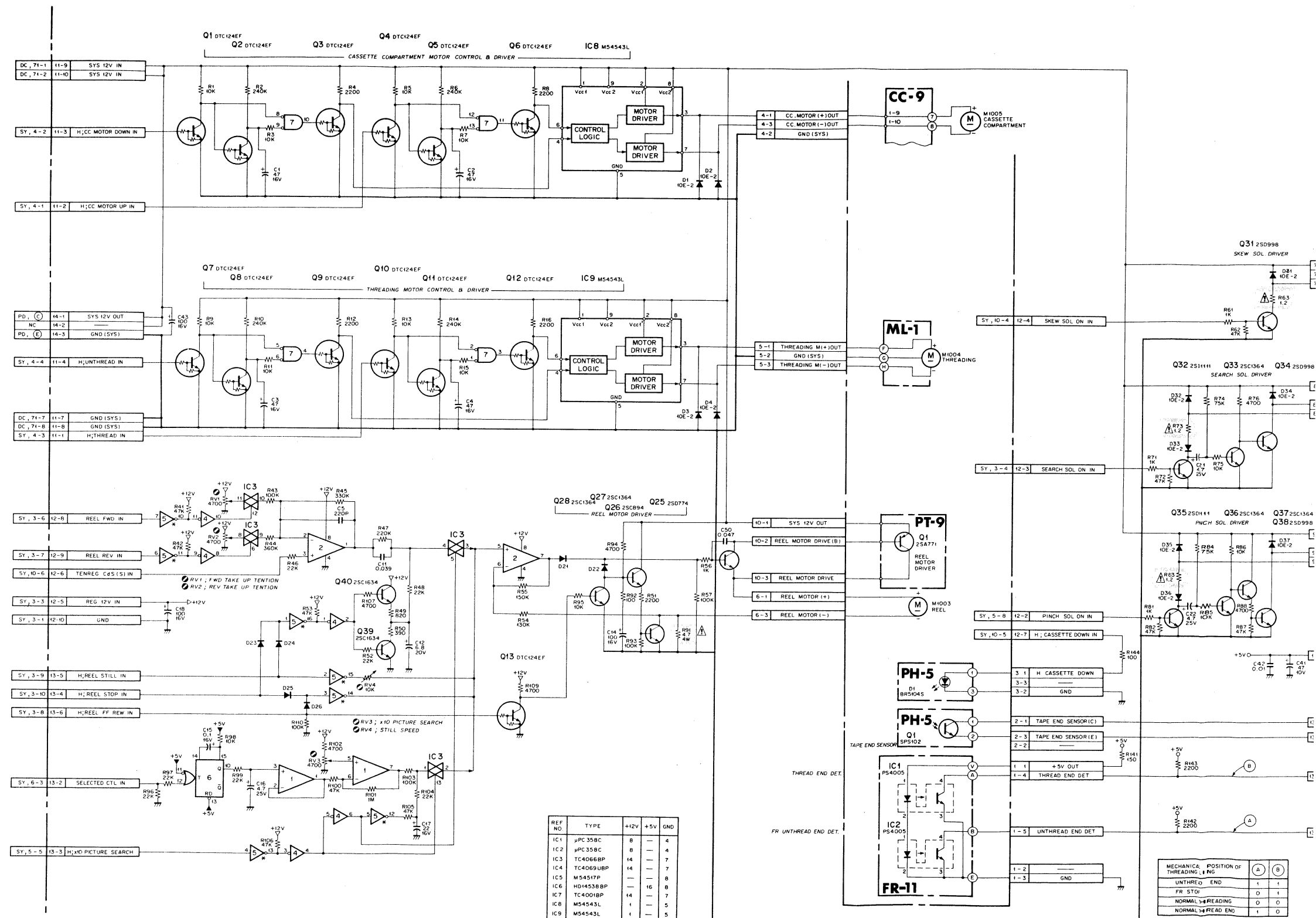
PH-5
-SOLDERING SIDE-



MR-11 (THREADING/CC MOTOR DRIVER)
FR-11 (THREADING RING DET.)
PH-5
PT-9

PT-9

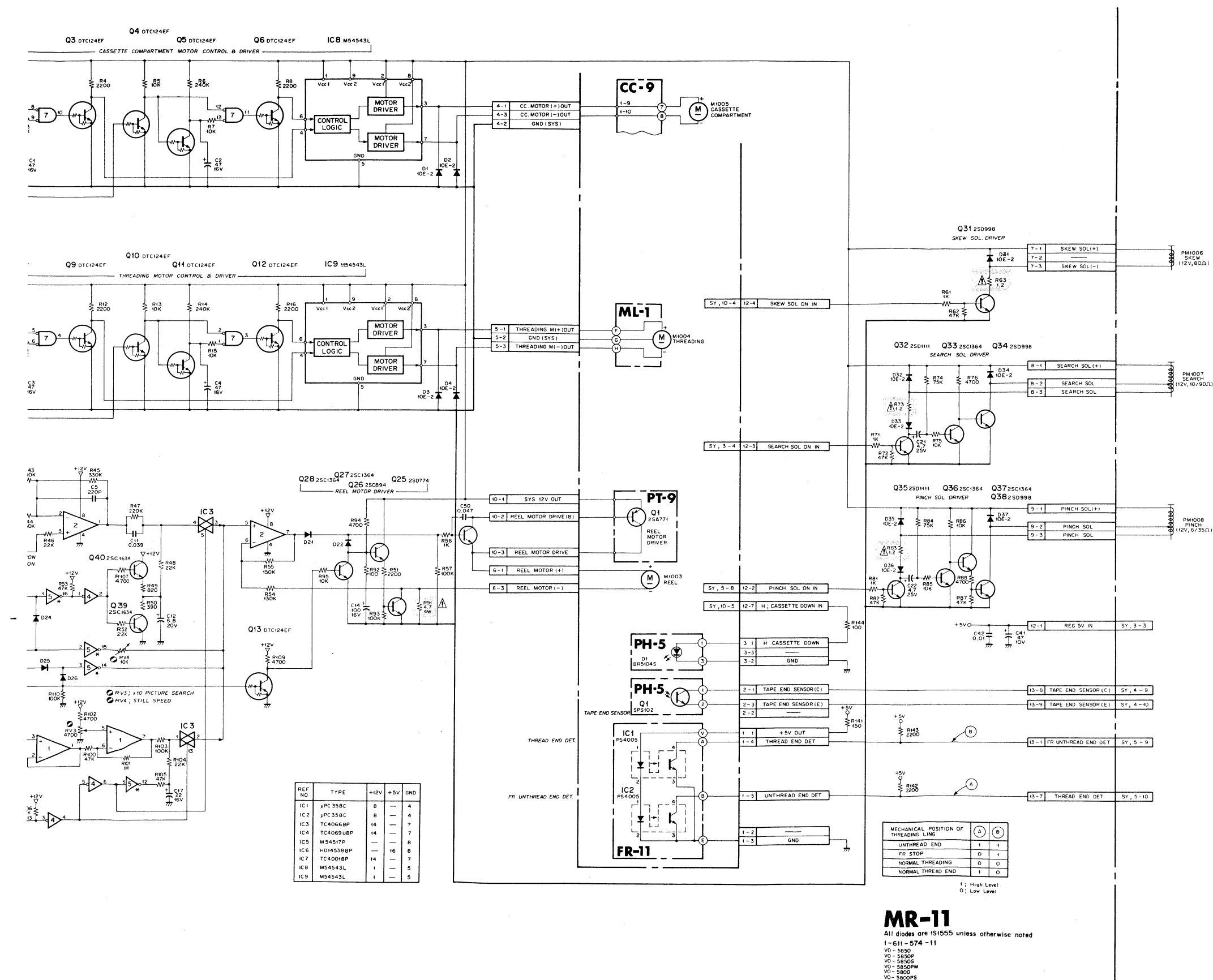
S/N 19911 AND LATER (USA)
S/N 20711 AND LATER (CND)



MECHANICAL POSITION OF THREADING	(A)	(B)
UNTREADED END	1	1
FR STOP	0	1
NORMAL READING	0	0
NORMAL READ END	1	0

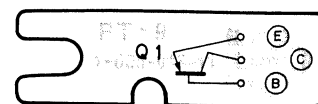
1; High Level
0; Low Level

MR-11
All diodes are 1S1555 unless otherwise noted
1-611-574-11
VO-5850
VO-5850P
VO-5850S
VO-5850PM
VO-5800
VO-5800PS

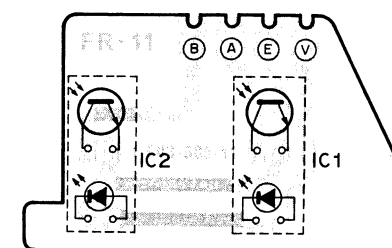


MR-11 (THREADING/CC MOTOR DRIVER)
FR-11 (THREADING RING DET.)
PH-5
PT-9

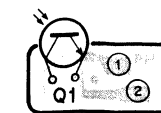
S/N 19911 AND LATER (USA)
S/N 20711 AND LATER (CND)



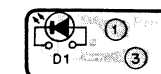
PT-9
- SOLDERING SIDE -



FR-11 - SOLDERING SIDE -

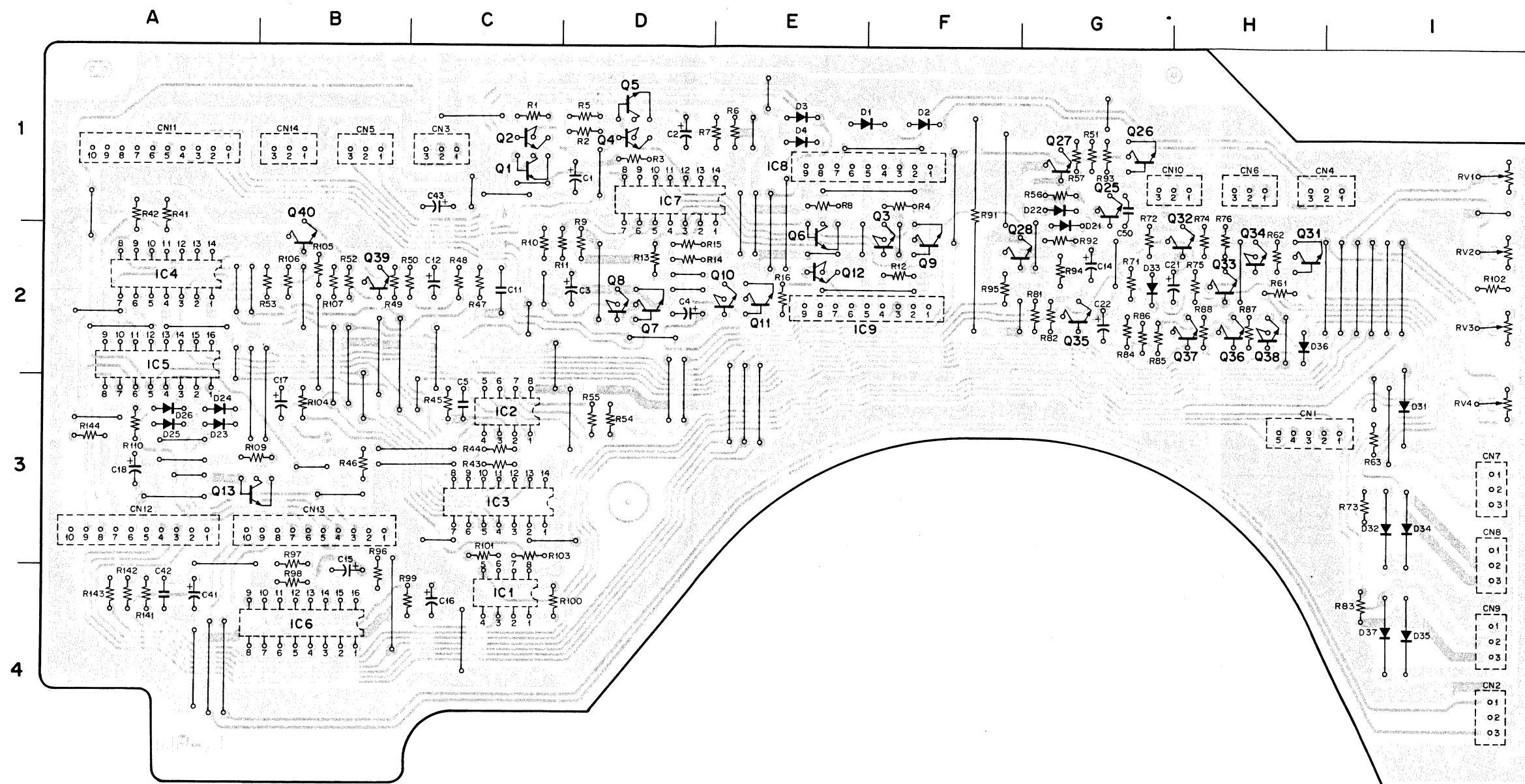


PH-5
- SOLDERING SIDE -



PH-5
- SOLDERING SIDE -

CN1	H-3	Q1	C-1
CN2	I-4	Q2	C-1
CN3	C-1	Q3	F-2
CN4	H-1	Q4	D-1
CN5	B-1	Q5	D-1
CN6	H-1	Q6	E-2
CN7	I-3	Q7	D-2
CN8	I-3	Q8	D-2
CN9	I-4	Q9	F-2
CN10	H-1	Q10	E-2
CN11	A-1	Q11	E-2
CN12	A-3	Q12	E-2
CN13	B-3	Q13	B-3
CN14	B-1	Q25	G-1
		Q26	G-1
		Q27	G-1
D1	E-1	Q28	F-2
D2	F-1	Q31	H-2
D3	E-1	Q32	H-2
D4	E-1	Q33	H-2
D21	G-2	Q34	H-2
D22	G-1	Q35	G-2
D23	A-3	Q36	H-2
D24	A-3	Q37	H-2
D25	A-3	Q38	H-2
D26	A-3	Q39	B-2
D31	I-3	Q40	B-2
D32	I-3		
D33	G-2	RV1	I-1
D34	I-3	RV2	I-2
D35	I-4	RV3	I-2
D36	H-2	RV4	I-3
D37	I-4		
IC1	C-4		
IC2	C-3		
IC3	C-3		
IC4	A-2		
IC5	A-2		
IC6	B-4		
IC7	D-1		
IC8	E-1		
IC9	E-2		



MR-11 - SOLDERING SIDE -

1-611-574-11
VO-5850
VO-5850P
VO-5850S
VO-5850PM
VO-5800
VO-5800PS

)

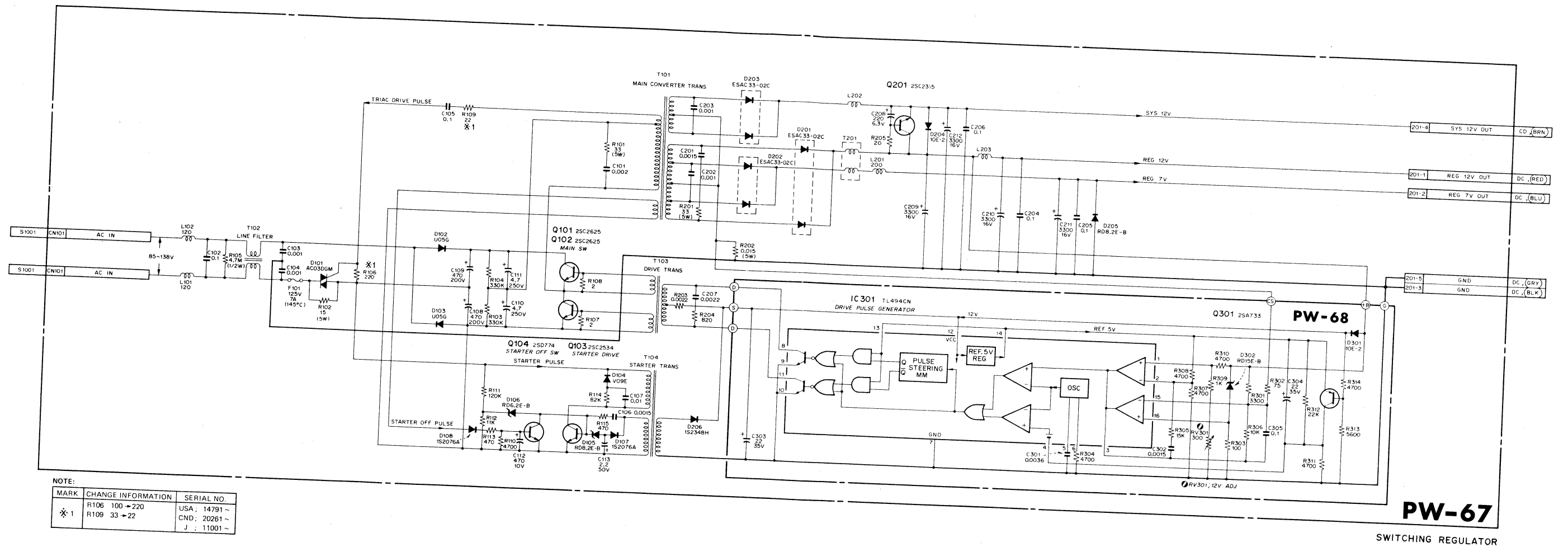
E-

)

UR-01 UR-01

UR-01 (SWITCHING REGULATOR)
PW-67
PW-68

S/N UP TO 10140 (USA)
S/N UP TO 20010 (CND)



NOTE: The shaded and  -marked components are critical to safety. Replace only with same components as specified.

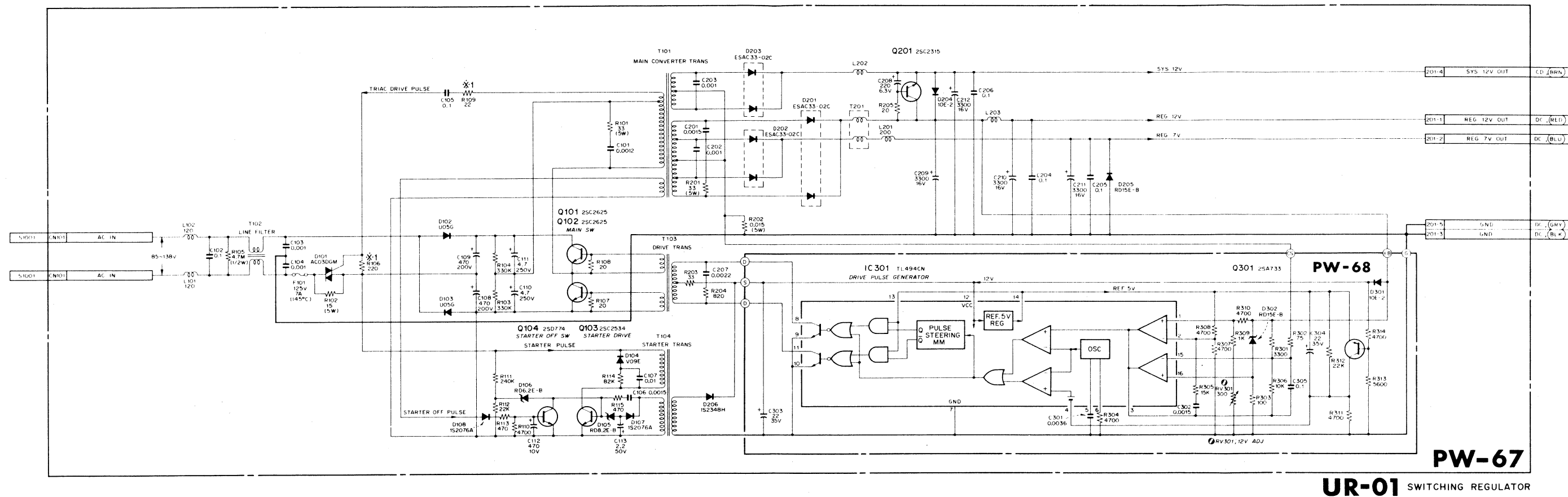
UR-01 (SWITCHING REGULATOR)

PW-67

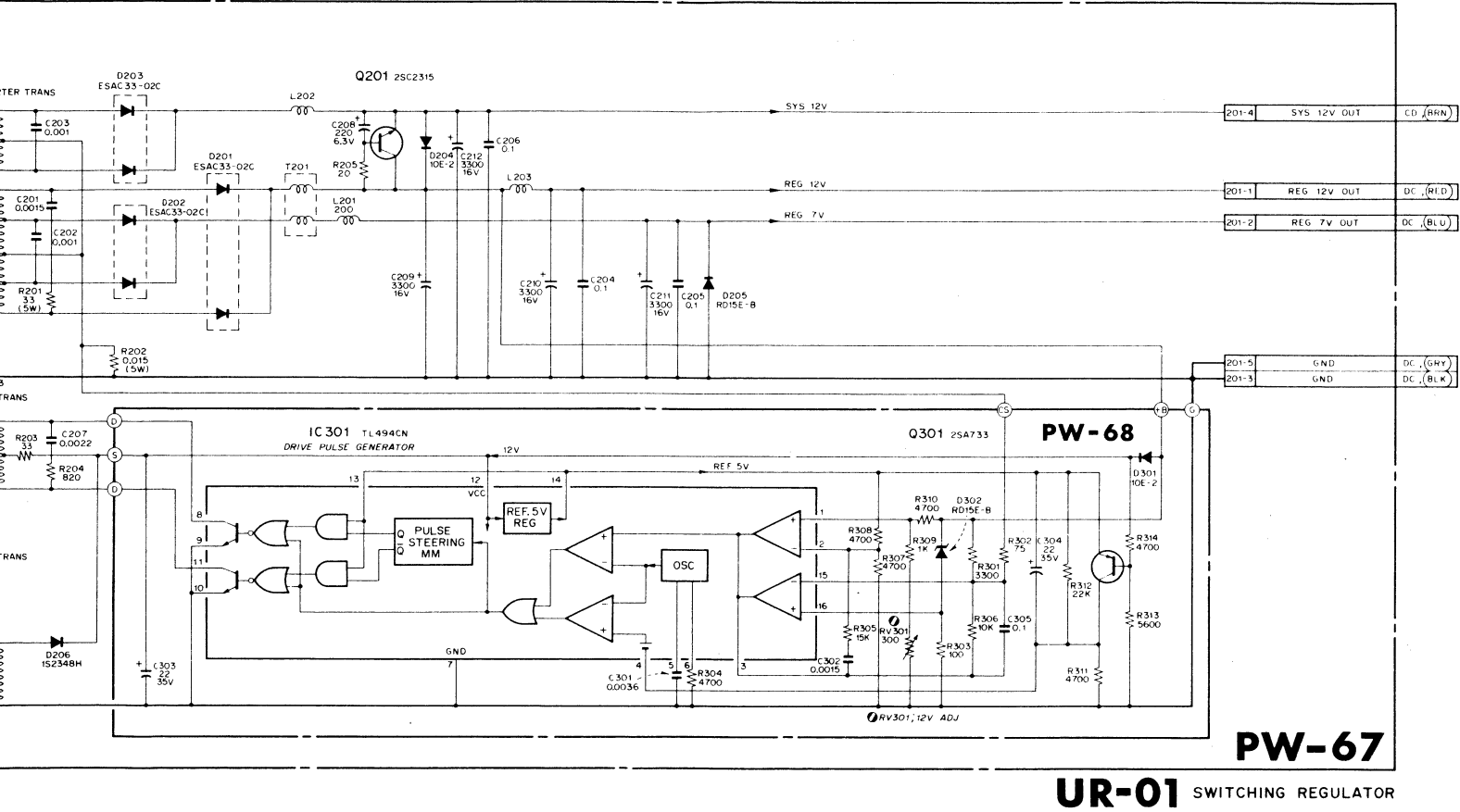
PW-68

S/N 10141 AND LATER (USA)

S/N 20011 AND LATER (CND)

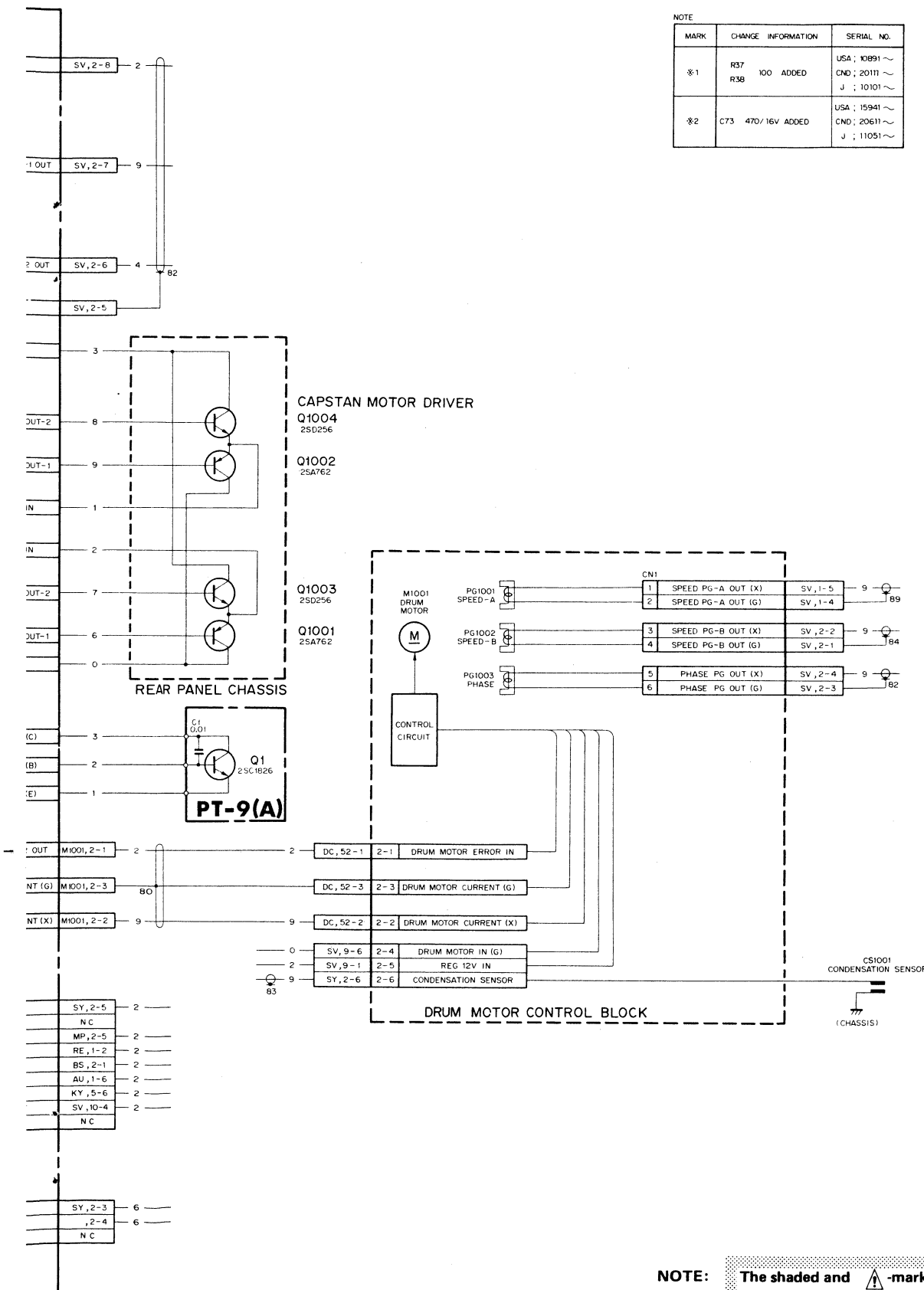


NOTE		
MARK	CHANGE INFORMATION	SERIAL NO
✱ 1	R106 100 → 220 R109 33 → 22	USA 18311 ~ CND 20661 ~ J 11401 ~ PM 10031 ~



NOTE

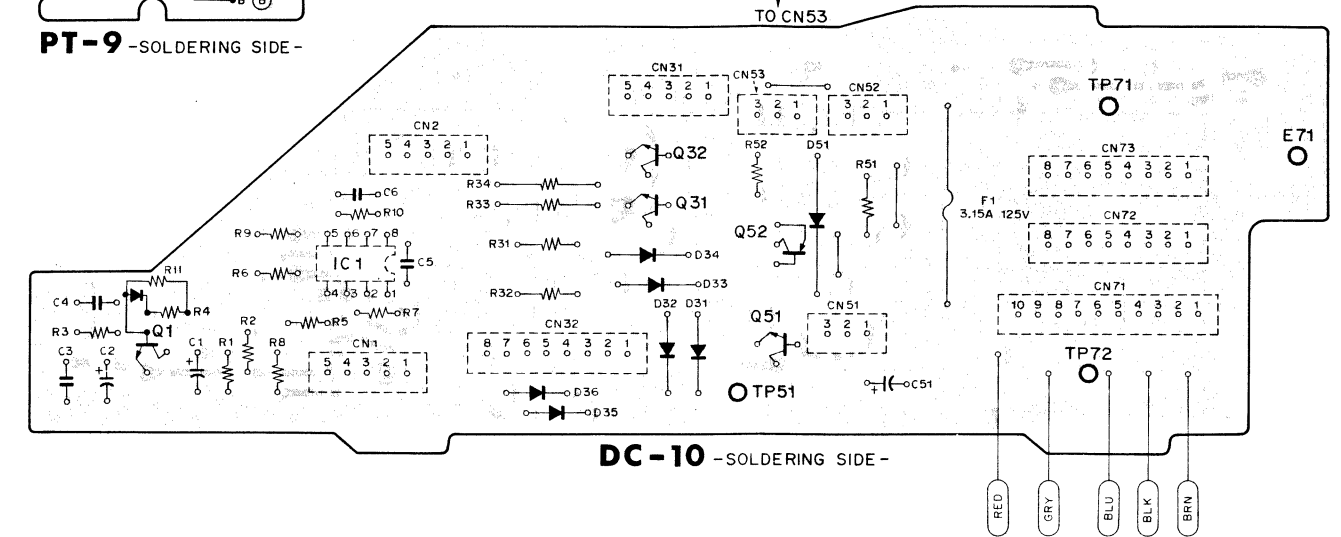
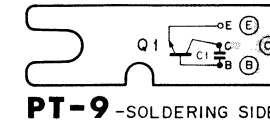
MARK	CHANGE INFORMATION	SERIAL NO.
※1	R37 R38 100 ADDED	USA: 10891 ~ CND: 20111 ~ J: 10101 ~
※2	C73 470/16V ADDED	USA: 15941 ~ CND: 20611 ~ J: 11051 ~



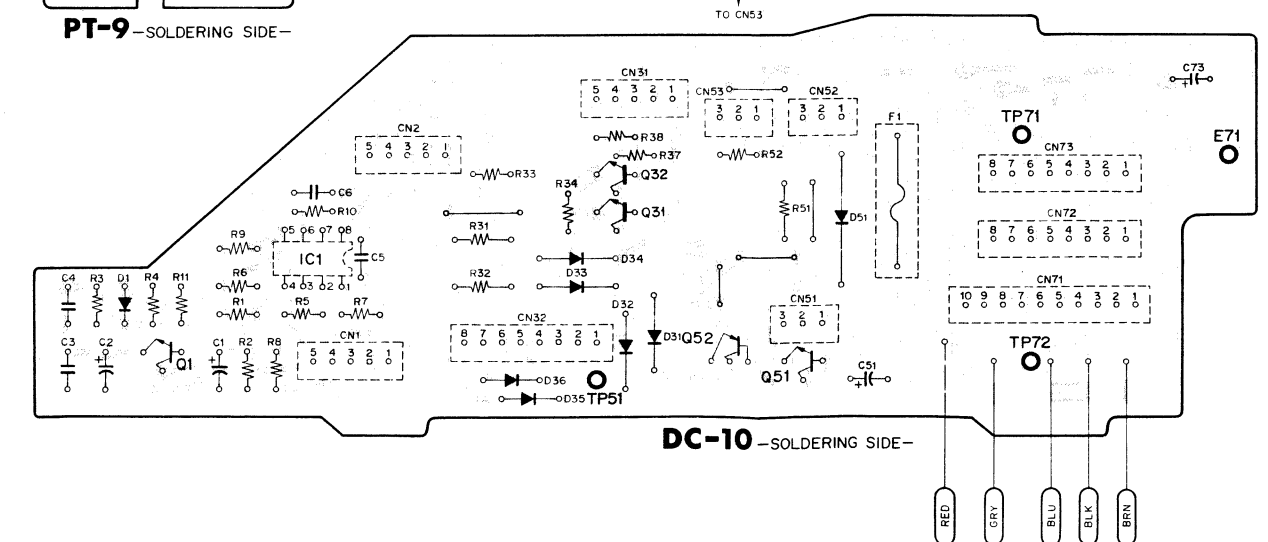
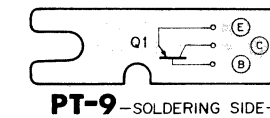
NOTE: The shaded and -marked components are critical to safety. Replace only with same components as specified.

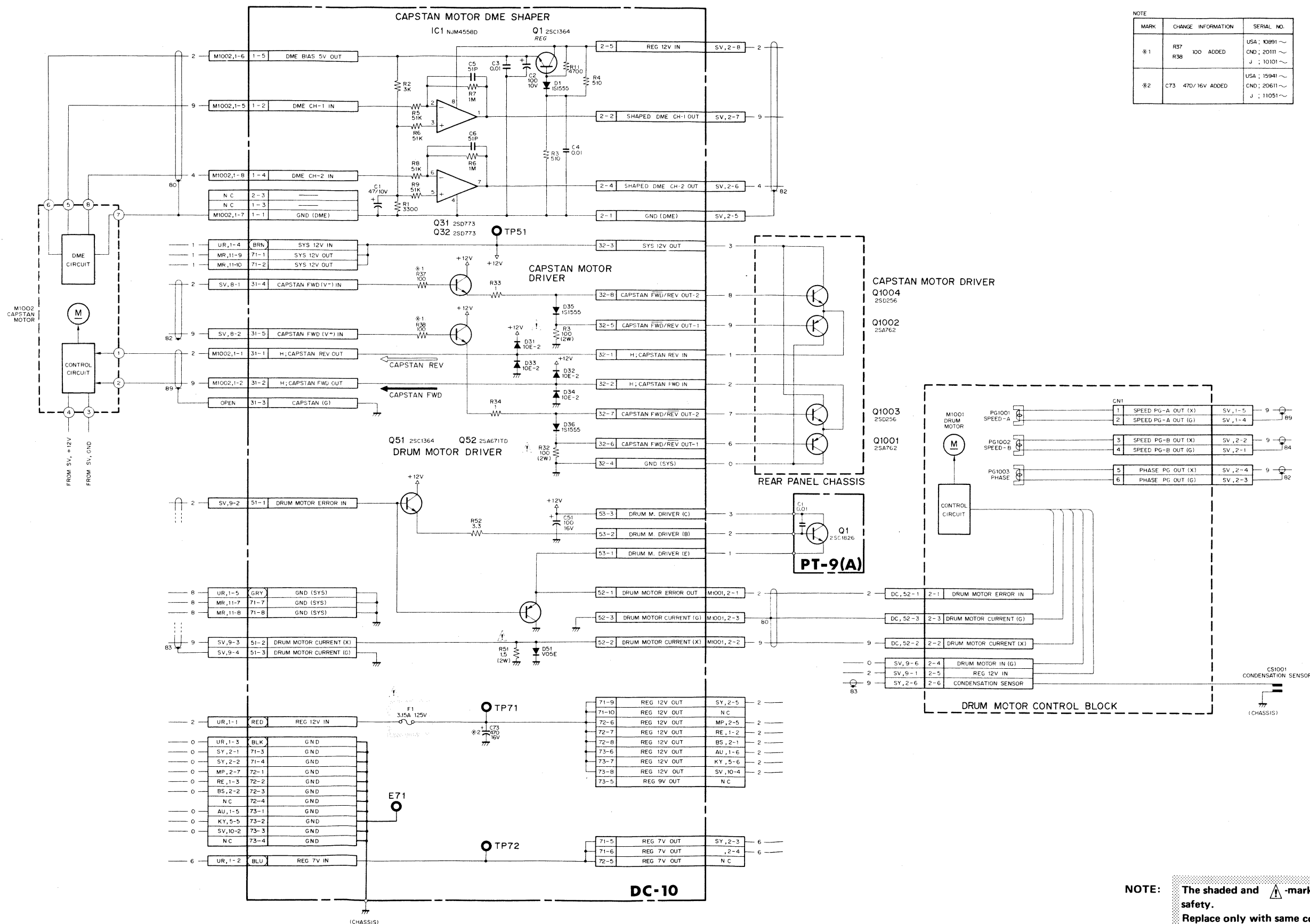
DC-10
PT-9

S/N UP TO 10890 (USA)
S/N UP TO 20110 (CND)

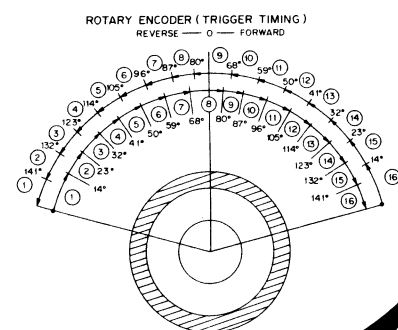


S/N 10891 AND LATER (USA)
S/N 20111 AND LATER (CND)





KY-13 (FUNCTION KEY BOARD)
DP-10



1; HIGH LEVEL
0; LOW LEVEL

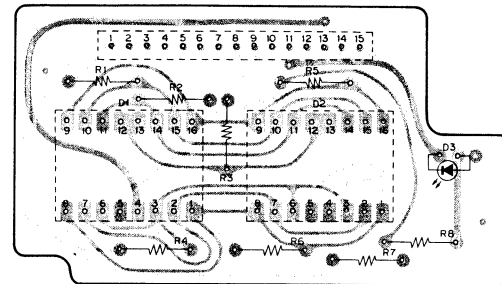
1; HIGH LEVEL
0; LOW LEVEL

KY-13/DP-10

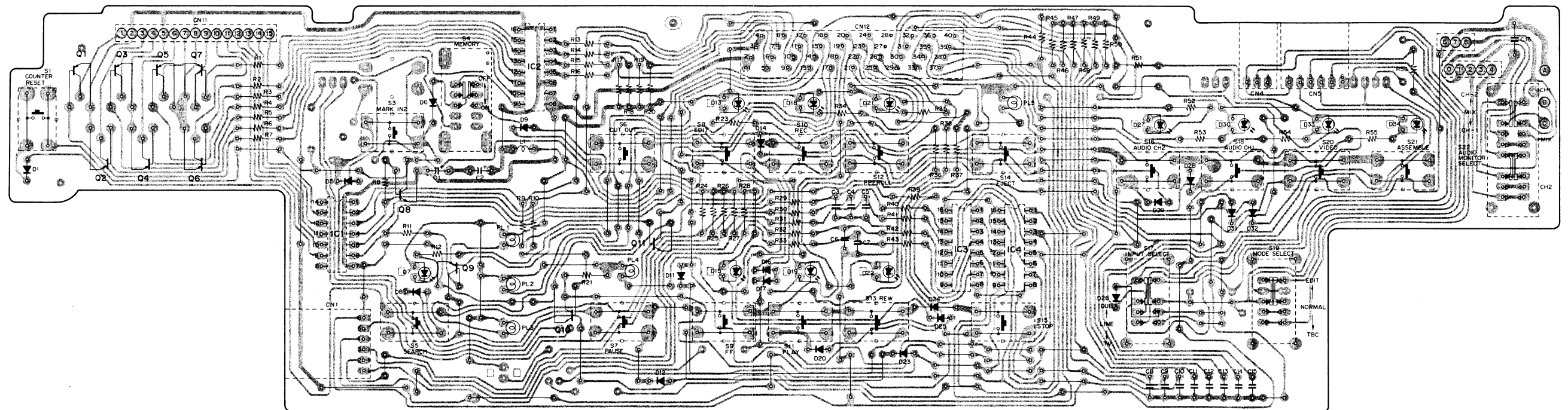


KY-13 (FUNCTION KEY BOARD)
DP-10

S/N 10141 ~ 13690 (USA)
S/N 20011 ~ 20210 (CND)



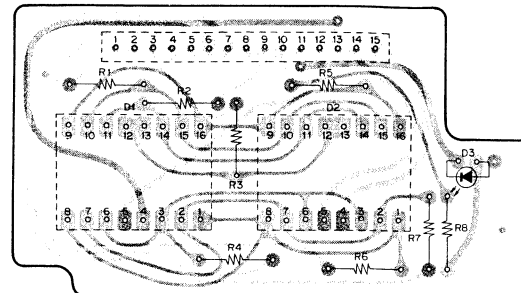
DP-10 - SOLDERING SIDE -



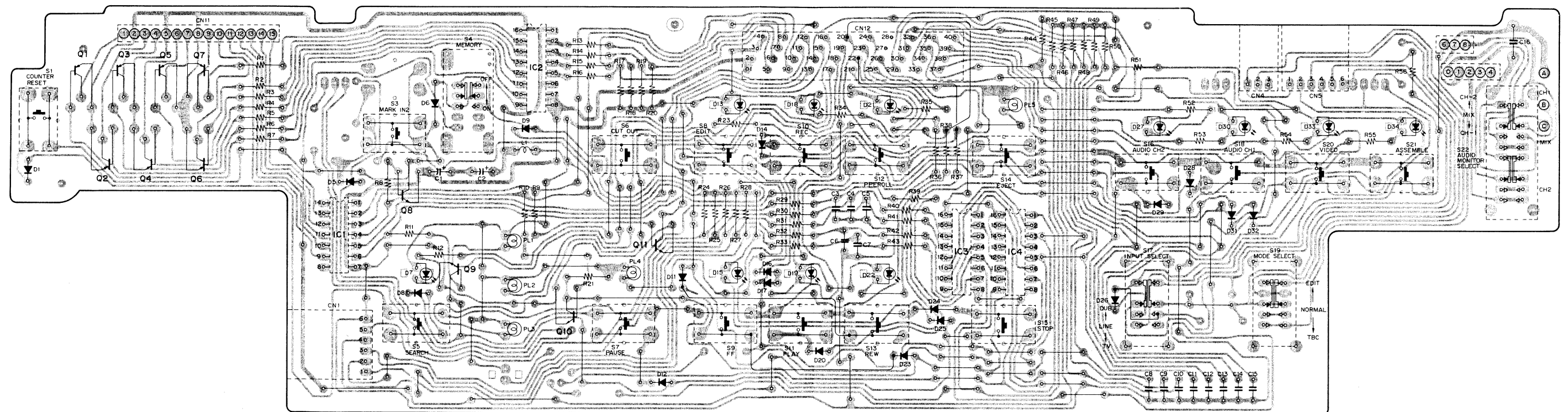
KY-13 - SOLDERING SIDE -

KY-13 (FUNCTION KEY BOARD)
DP-10

S/N UP TO 10140 (USA)
S/N UP TO 20010 (CND)

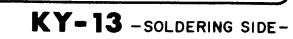
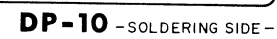


DP-10 - SOLDERING SIDE -

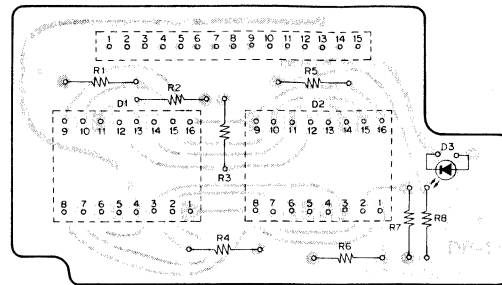


KY-13 - SOLDERING SIDE -

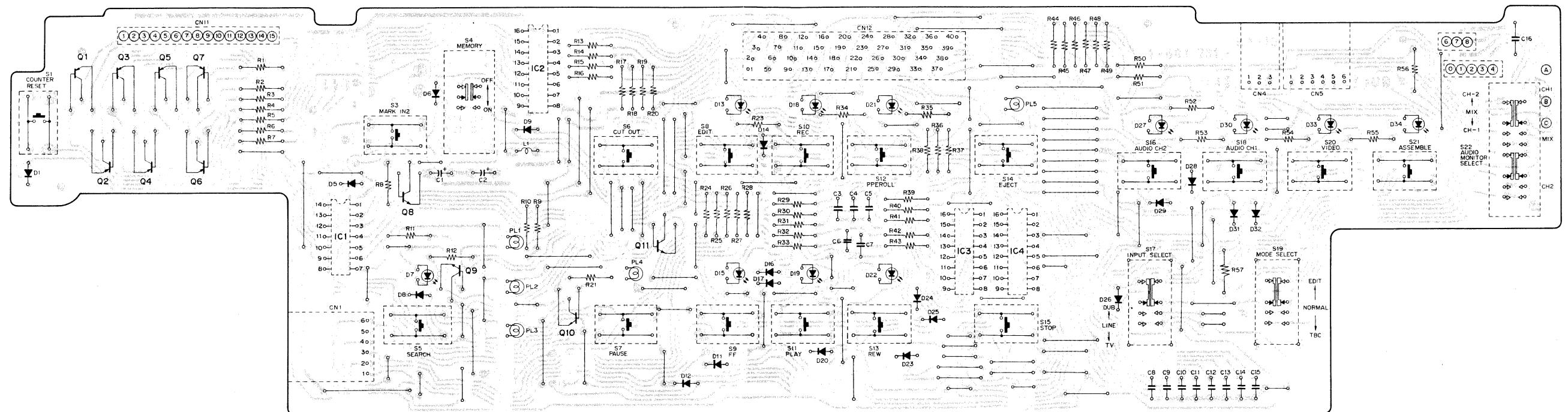
S/N 13691 ~ 19310 (USA)
S/N 20211 ~ 20660 (CND)



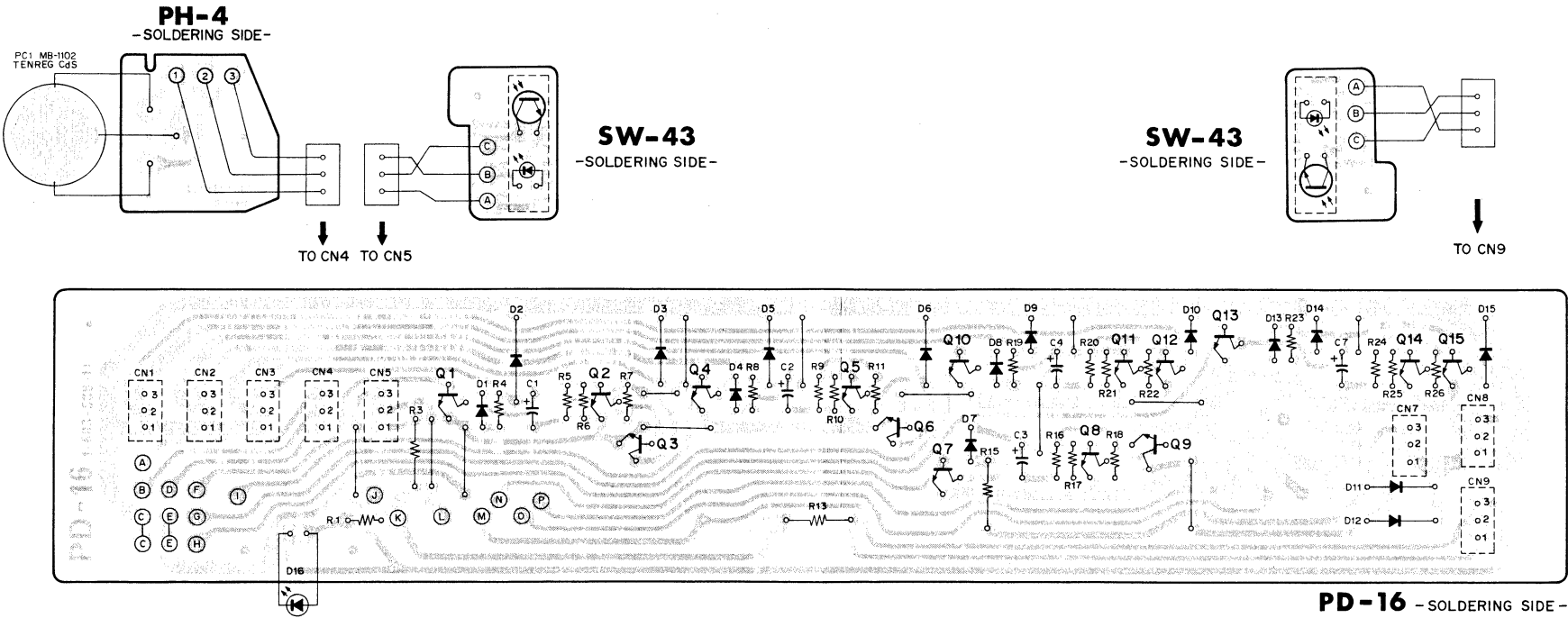
S/N 19311 AND LATER (USA)
S/N 20661 AND LATER (CND)



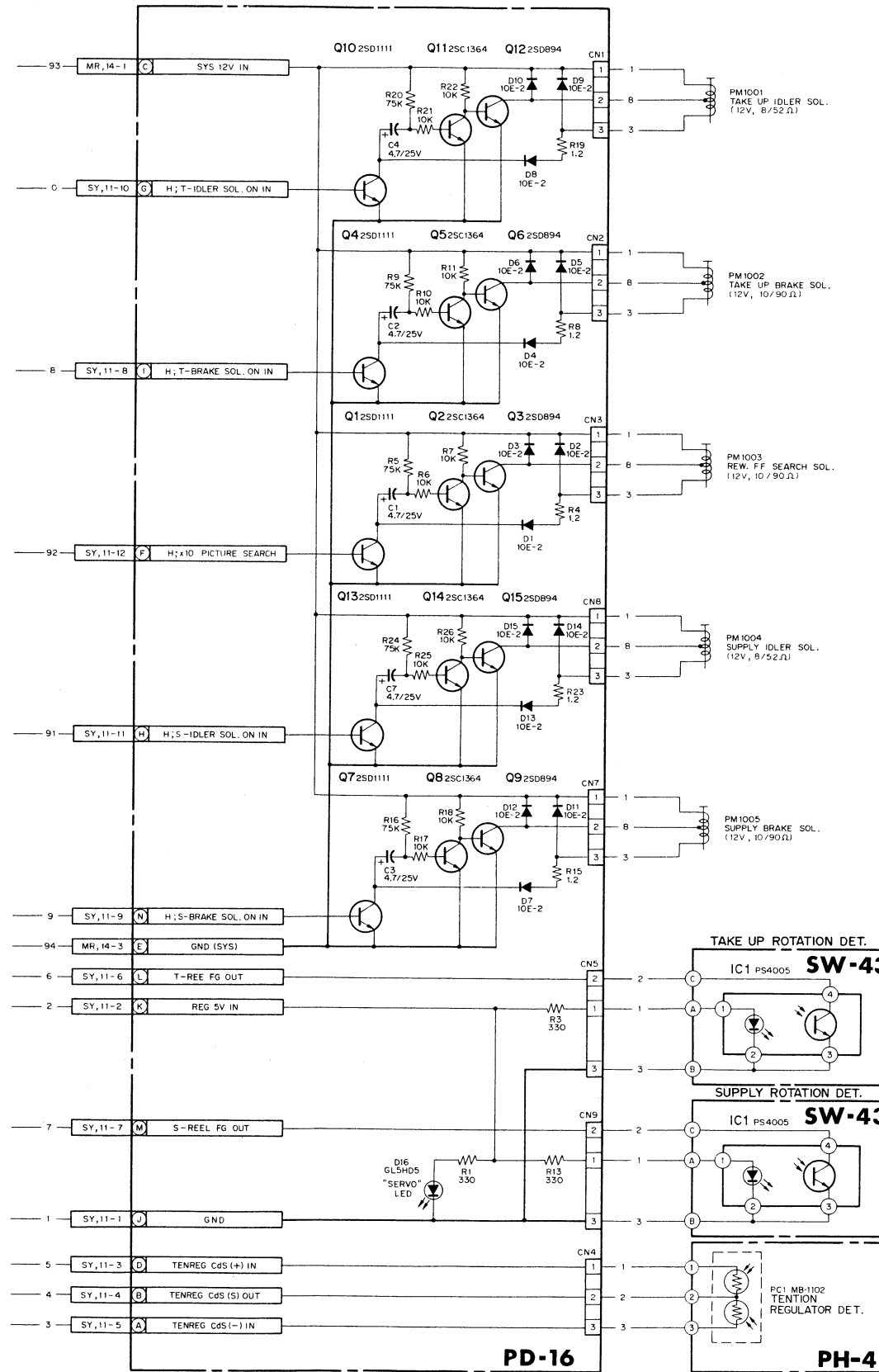
DP-10 -SOLDERING SIDE-

KY-13 -SOLDERING SIDE-
1-603-731-16
VO-5850

PD-16
SW-43
PH-4

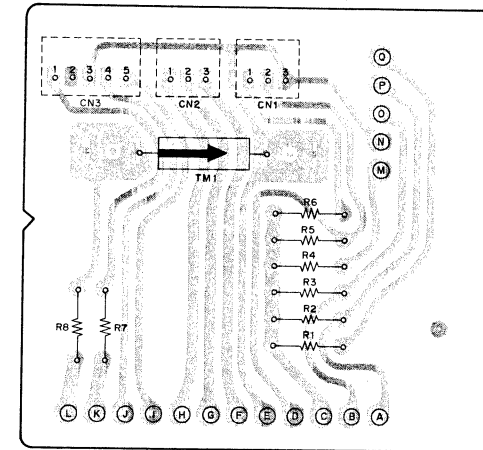
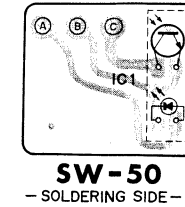
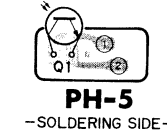
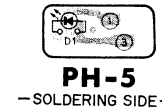


PD-16
SW-43
PH-4

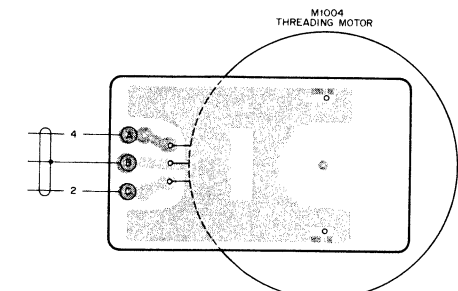
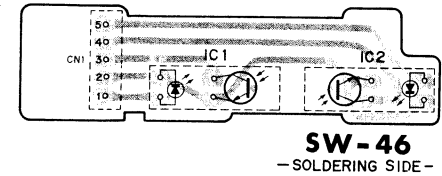


NOTE: The shaded and Δ -marked components are critical to safety. Replace only with same components as specified.

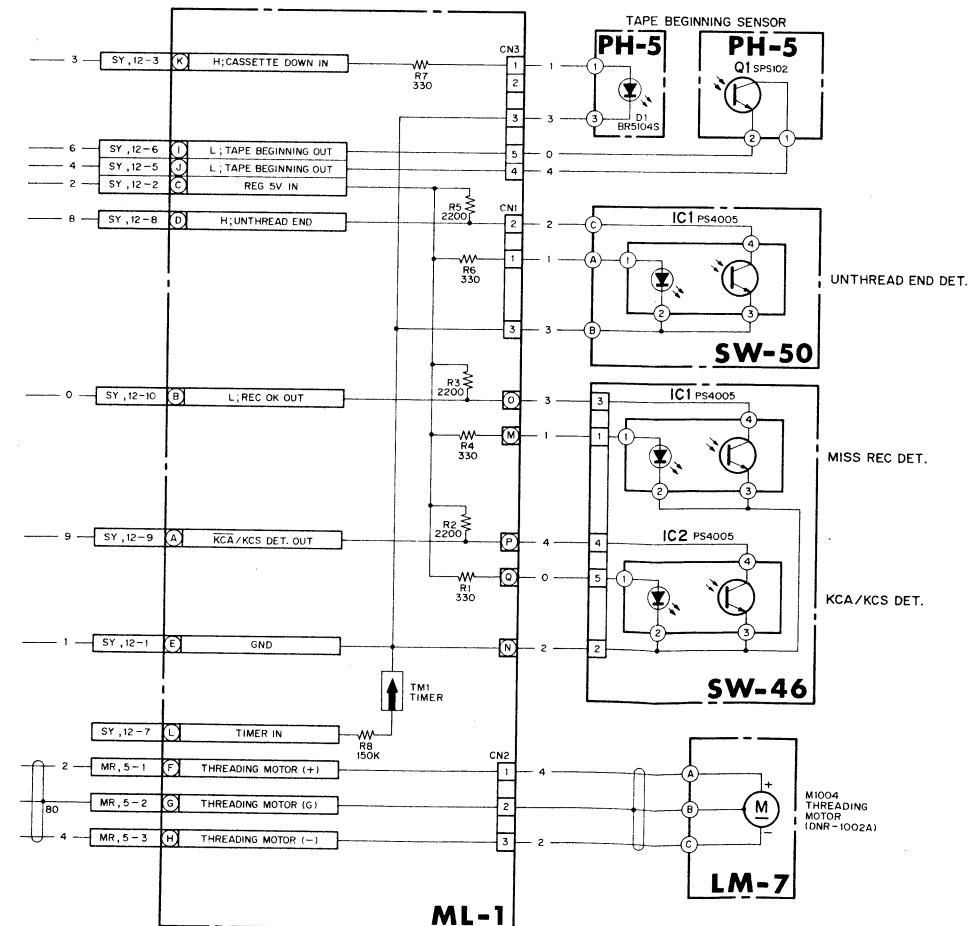
ML-1
LM-7
PH-5
SW-46
SW-50



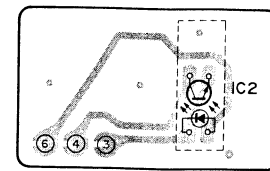
ML-1 - SOLDERING SIDE -



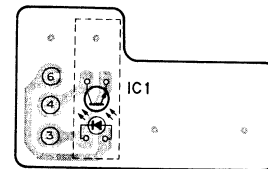
LM-7 - SOLDERING SIDE -



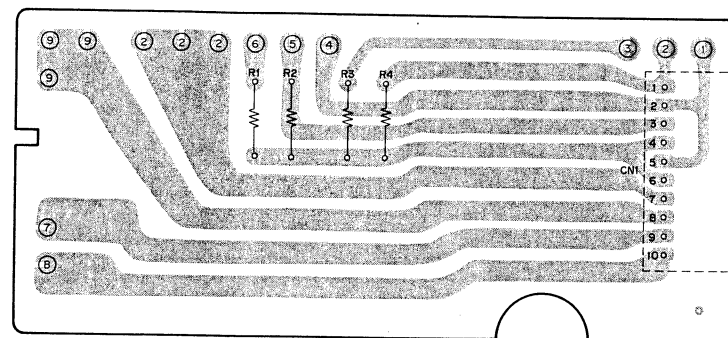
CC-9
CC-10
CC-11



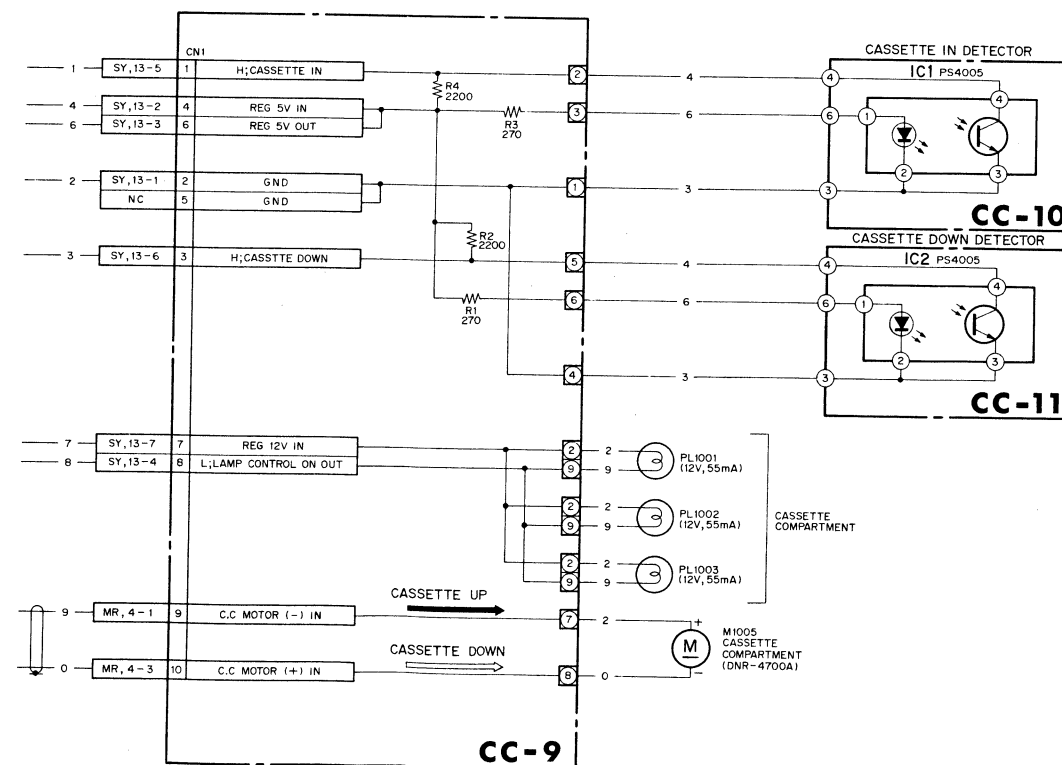
CC-11 - SOLDERING SIDE -



CC-10 - SOLDERING SIDE -

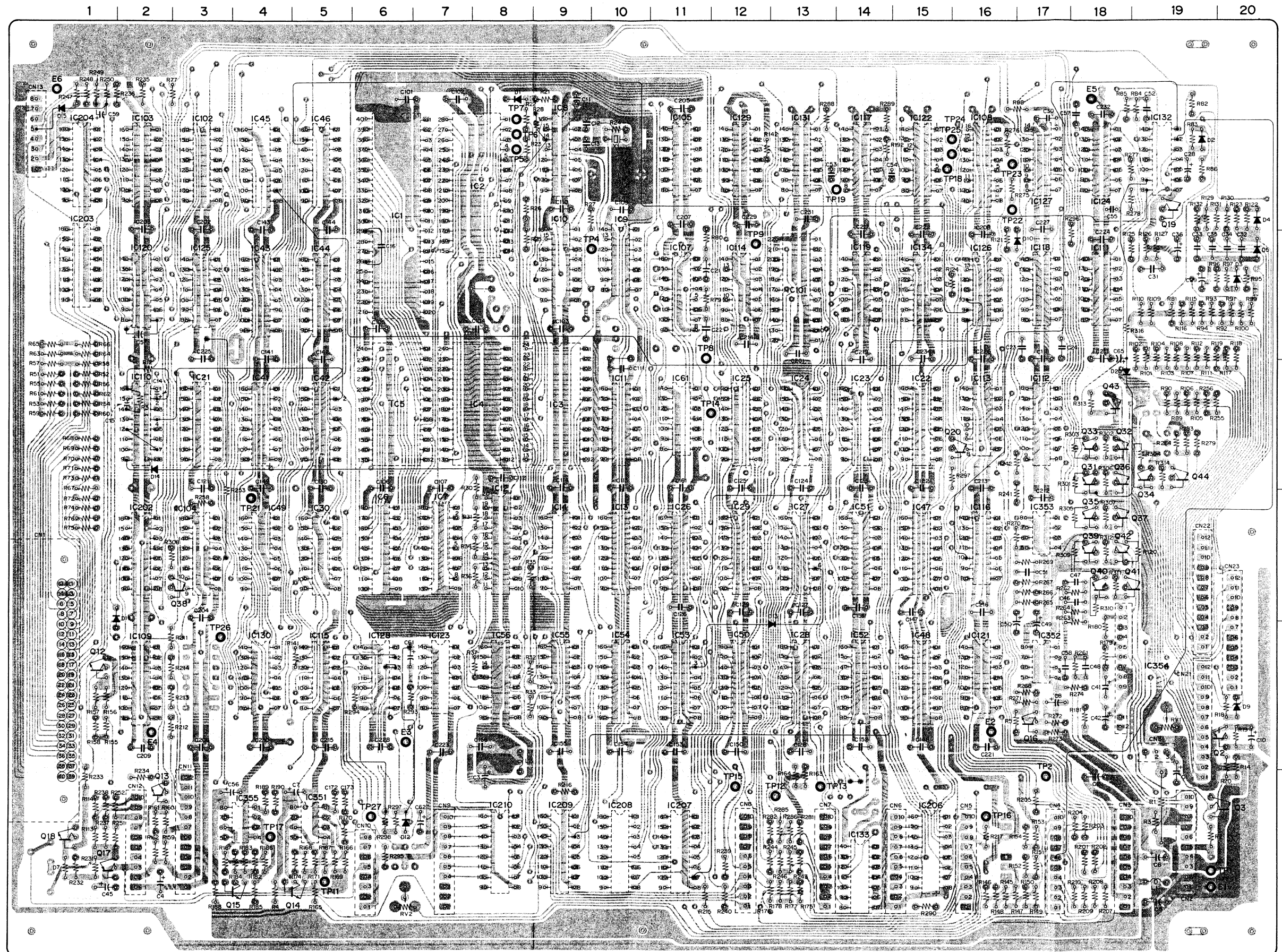


CC-9 - SOLDERING SIDE -

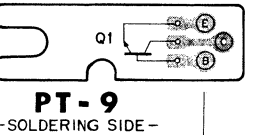


SY-68 (SYSTEM CONTROL)
PT-9

S/N UP TO 10440 (USA)
S/N UP TO 20110 (CND)



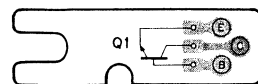
CN1	B-1	IC41	D-4
CN2	A-19	IC42	D-5
CN3	A-18	IC43	E-4
CN4	A-17	IC44	E-5
CN5	A-16	IC45	F-4
CN6	A-15	IC46	F-5
CN7	A-13	IC47	C-15
CN8	A-12	IC48	B-15
CN9	A-7	IC49	C-4
CN10	A-6	IC50	B-12
CN11	A-3	IC51	C-14
CN12	A-2	IC52	B-14
CN13	F-1	IC53	B-11
CN21	B-19	IC54	B-10
CN22	C-19	IC55	B-9
CN23	B-20	IC56	B-8
CN31	B-19	IC61	D-11
D1	F-8	IC101	E-13
D2	F-19	IC102	F-3
D3	E-20	IC103	F-2
D4	F-20	IC104	C-3
D5	E-20	IC105	F-11
D7	A-1	IC107	E-11
D9	B-20	IC108	F-16
D10	E-17	IC109	B-2
D11	B-2	IC110	D-2
D12	A-6	IC111	E-18
D13	B-12	IC112	D-17
D14	D-2	IC113	D-16
D15	F-1	IC114	E-12
D20	E-18	IC115	B-5
E1	A-19	IC116	C-16
E2	B-16	IC117	F-14
E3	B-6	IC118	E-17
E4	B-2	IC119	E-14
E5	F-18	IC120	E-2
E6	F-6	IC121	B-16
IC1	F-6	IC122	F-15
IC2	F-8	IC123	B-7
IC3	D-9	IC124	F-18
IC4	D-8	IC125	E-3
IC5	D-6	IC126	E-16
IC6	C-6	IC127	F-17
IC7	C-7	IC128	B-6
IC8	F-9	IC129	F-12
IC9	E-10	IC130	B-4
IC10	E-9	IC131	F-13
IC11	D-10	IC132	F-19
IC12	C-8	IC133	A-14
IC13	C-10	IC134	E-15
IC14	C-9	IC202	C-2
IC21	D-3	IC203	E-1
IC22	D-15	IC204	F-1
IC23	D-14	IC206	A-15
IC24	D-13	IC207	A-11
IC25	D-12	IC208	A-10
IC26	C-11	IC209	A-9
IC27	C-13	IC210	A-8
IC28	B-13	IC251	A-5
IC29	C-12	IC352	B-17
IC30	C-5	IC353	C-17
		IC354	B-18
		IC355	A-4



SY-68 - SOLDERING SIDE -

SY-68
(SYSTEM CONTROL)
PT-9S/N UP TO 10440 (USA)
S/N UP TO 20110 (CND)

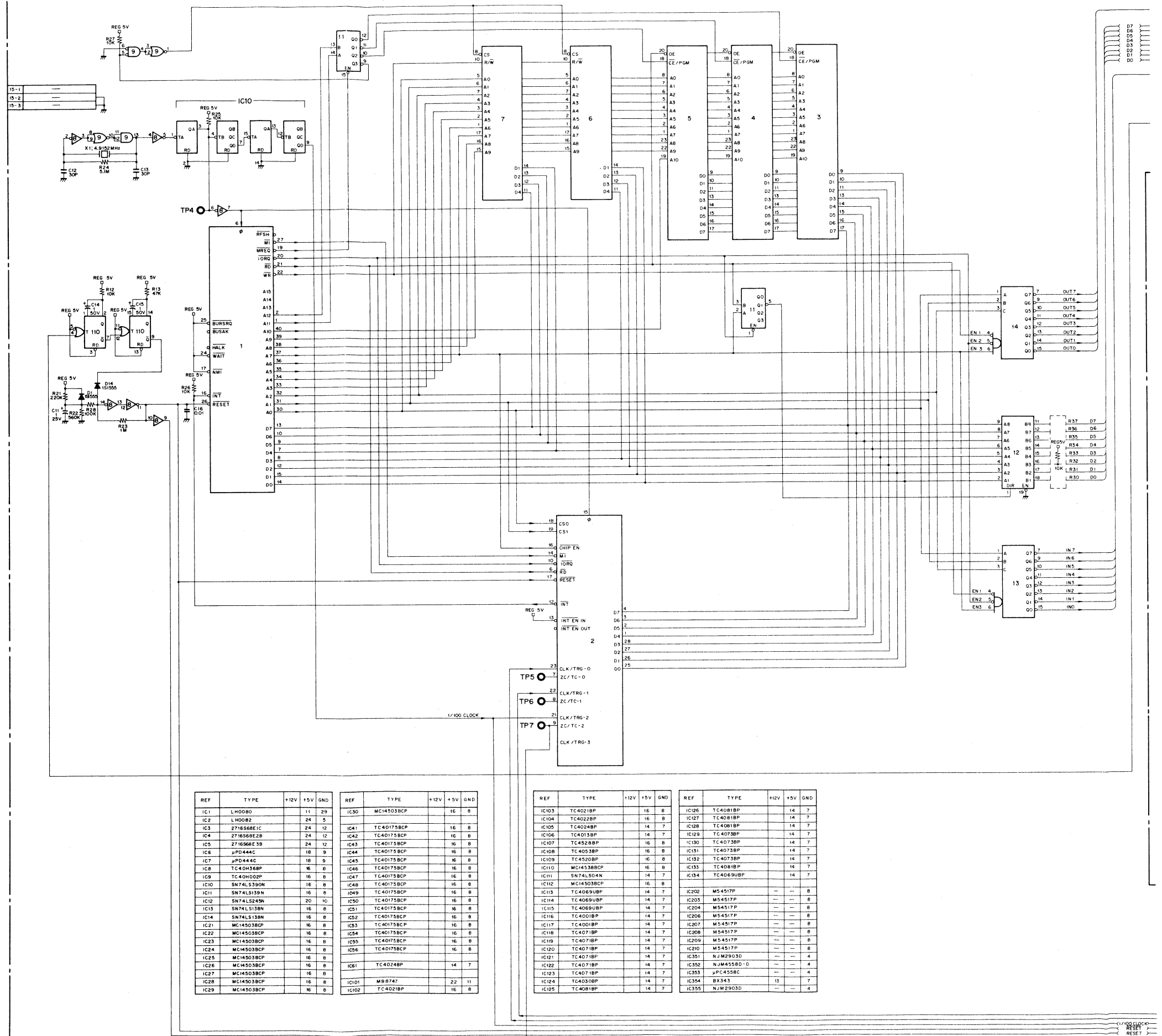
CN1	B - 1	IC41	D - 4	Q2	B - 20
CN2	A - 19	IC42	D - 5	Q3	A - 2
CN3	A - 18	IC43	E - 4	Q12	B - 1
CN4	A - 17	IC44	E - 5	Q13	A - 2
CN5	A - 16	IC45	F - 4	Q14	A - 4
CN6	A - 15	IC46	F - 5	Q15	A - 3
CN7	A - 13	IC47	C - 15	Q16	B - 17
CN8	A - 12	IC48	B - 15	Q17	A - 1
CN9	A - 10	IC49	C - 4	Q18	A - 1
CN10	A - 6	IC50	B - 12	Q19	F - 19
CN11	A - 3	IC51	C - 14	Q20	D - 16
CN12	A - 2	IC52	B - 14	Q31	D - 18
CN13	F - 1	IC53	B - 11	Q32	D - 18
CN21	B - 19	IC54	B - 10	Q33	D - 18
CN22	C - 19	IC55	B - 9	Q34	D - 18
CN23	B - 20	IC56	B - 8	Q35	C - 18
CN31	B - 19	IC61	D - 11	Q36	D - 18
		IC101	E - 13	Q37	C - 18
		IC102	F - 3	Q38	C - 3
		IC103	F - 2	Q39	C - 18
		IC104	C - 3	Q40	C - 18
		IC105	F - 11	Q41	C - 19
		IC107	E - 11	Q42	C - 18
		IC108	F - 16	Q43	D - 18
		IC109	B - 2	Q44	D - 19
		IC110	D - 2		
		IC111	E - 18	RV1	B - 19
		IC112	D - 17	RV2	A - 6
		IC113	D - 16		
		IC114	E - 12	TP1	A - 19
		IC115	B - 5	TP2	A - 17
		IC116	C - 16	TP4	E - 9
		IC117	F - 14	TP5	F - 8
		IC118	E - 17	TP8	E - 11
		IC119	E - 14	TP9	E - 12
		IC120	E - 2	TP11	A - 5
		IC121	B - 16	TP12	A - 13
		IC122	F - 15	TP13	A - 13
		IC123	B - 7	TP14	D - 11
		IC124	F - 18	TP15	A - 13
		IC125	E - 3	TP16	A - 16
		IC126	E - 16	TP17	A - 4
		IC127	F - 17	TP18	F - 15
		IC128	B - 6	TP19	F - 13
		IC129	F - 12	TP21	C - 4
		IC130	B - 4	TP22	F - 16
		IC131	F - 13	TP23	F - 16
		IC132	F - 19	TP24	F - 16
		IC133	A - 14	TP25	F - 15
		IC134	E - 15	TP26	B - 3
		IC202	C - 2	TP27	A - 6
		IC203	E - 1		
		IC204	F - 1	X1	F - 10
		IC206	A - 15		
		IC207	A - 11		
		IC208	A - 10		
		IC209	A - 9		
		IC210	A - 8		
		IC351	A - 5		
		IC352	B - 17		
		IC353	C - 17		
		IC354	B - 18		
		IC355	A - 4		

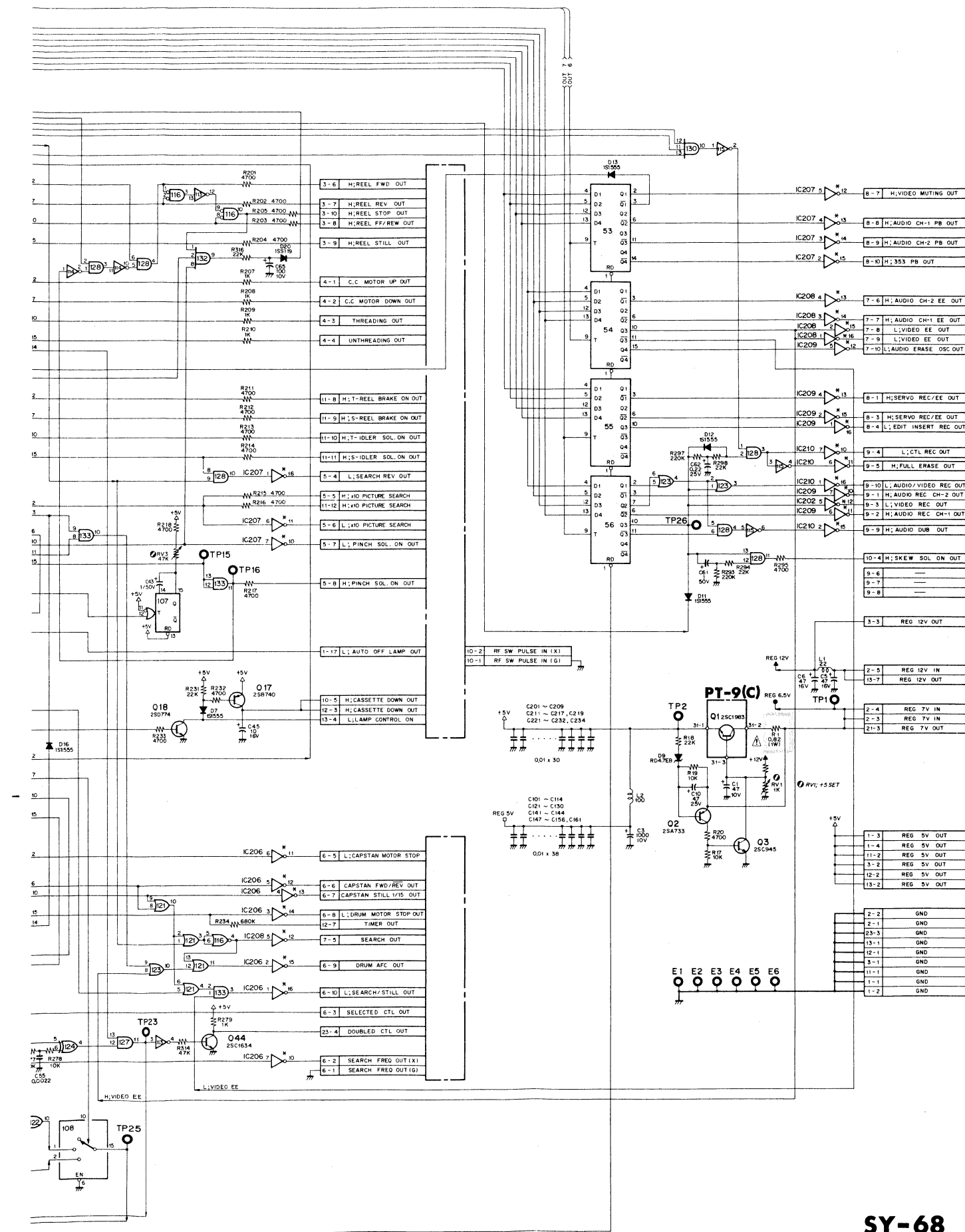


PT-9

-SOLDERING SIDE-

TO (N3)





SY-68

NOTE:

The shaded and -marked components are critical to safety.
Replace only with same components as specified.

S/N 10441 ~ 10890 (USA)

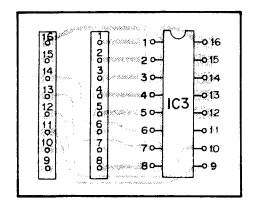


14-74 (b)

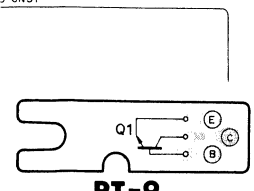
SY-68 (SYSTEM CONTROL)
PT-9

S/N 10441 ~ 11590 (USA)
S/N 20111 ~ 20210 (CND)

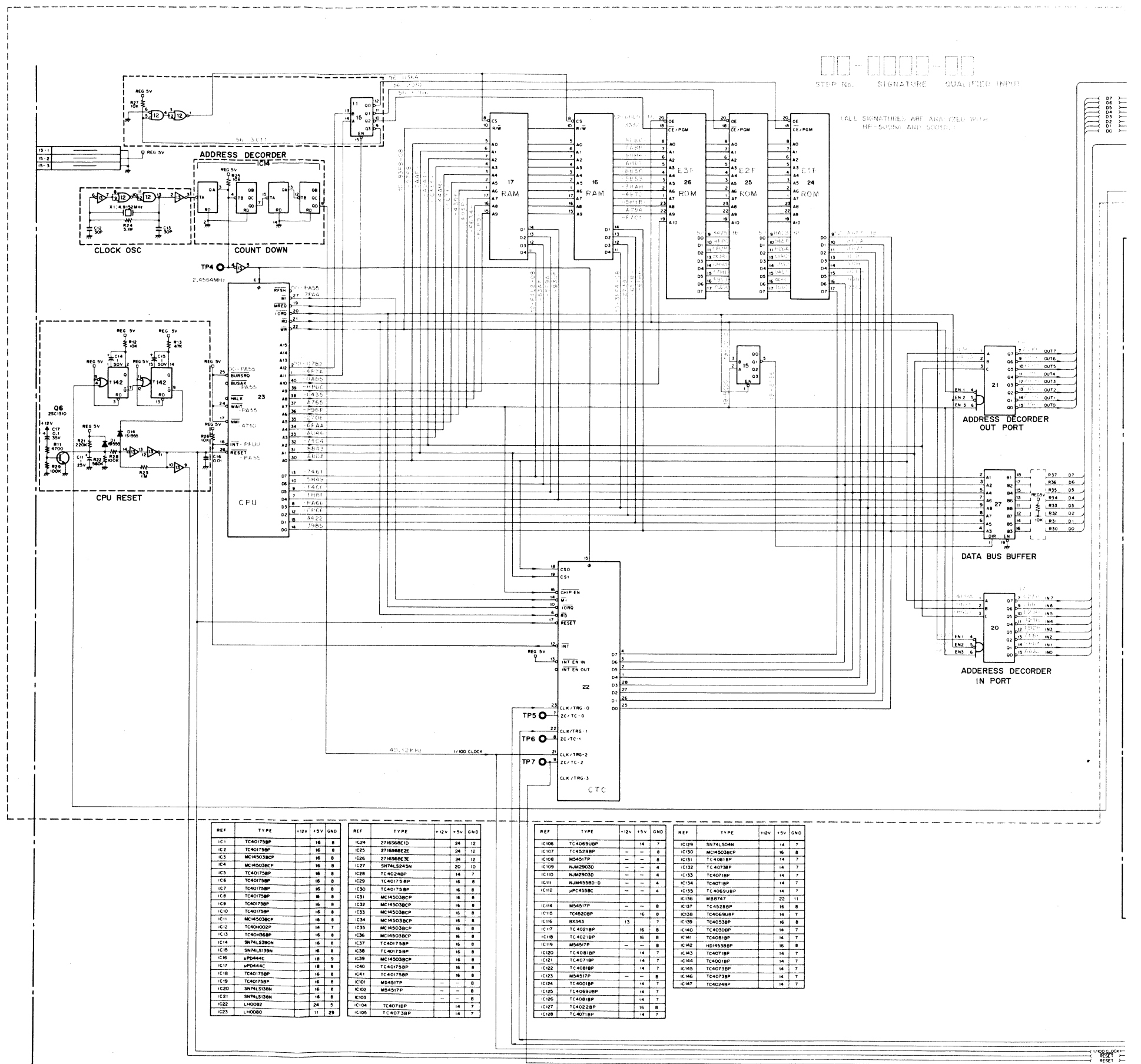
B-1	IC25	D-9	Q2	B-18
A-18	IC26	D-8	Q3	B-18
A-16	IC27	D-7	Q6	C-10
A-16	IC28	D-6	Q12	A-1
A-15	IC29	D-5	Q13	A-1
A-13	IC30	D-5	Q14	A-4
A-12	IC31	E-15	Q15	A-3
A-11	IC32	E-14	Q16	B-17
A-6	IC33	E-13	Q17	A-1
A-5	IC34	E-12	Q18	A-1
A-2	IC35	E-11	Q19	E-17
A-1	IC36	E-10	Q20	A-15
3-1	IC37	E-9	Q31	E-18
B-18	IC38	E-8	Q32	D-18
C-18	IC39	E-7	Q33	D-18
C-18	IC40	E-6	Q34	D-18
C-18	IC41	E-5	Q35	E-18
3-18	IC101	A-13	Q36	D-18
C-10	IC102	A-12	Q37	F-18
E-18	IC103	A-10	Q38	E-18
E-18	IC104	A-10	Q39	E-18
D-18	IC105	A-9	Q40	E-18
C-18	IC106	A-8	Q41	E-18
A-1	IC107	A-7	Q42	E-18
3-18	IC108	A-7	Q43	E-18
F-18	IC109	A-4	Q44	F-18
A-8	IC110	A-3		
A-9	IC111	B-17	RV1	B-18
3-9	IC112	B-17	RV2	A-5
F-5	IC114	B-2	RV3	A-5
3-1	IC115	B-1		
3-8	IC116	B-1	TP1	A-18
A-18	IC117	C-3	TP2	C-16
A-10	IC118	C-2	TP4	C-11
3-1	IC119	C-1	TP5	D-14
C-1	IC120	D-3	TP6	D-14
3-6	IC121	D-2	TP7	D-14
F-18	IC122	D-1	TP8	F-11
	IC123	D-1	TP9	G-13
	IC124	E-3	TP10	E-18
3-15	IC125	E-2	TP11	A-4
3-14	IC126	E-1	TP12	A-4
3-13	IC127	E-1	TP13	A-3
3-12	IC128	F-2	TP16	F-1
3-11	IC129	F-18	TP17	A-3
3-10	IC130	G-18	TP18	A-3
3-9	IC131	G-17	TP22	C-16
3-8	IC132	G-16	TP23	G-7
3-7	IC133	G-15	TP24	G-9
3-6	IC134	G-14	TP25	G-9
3-5	IC135	G-13	TP26	A-8
C-14	IC136	G-12	TP28	A-1
C-11	IC137	G-11	TP29	A-1
C-10	IC138	G-10		
C-9	IC139	G-9	X1	C-14
C-8	IC140	G-7		
C-7	IC141	G-6		
C-6	IC142	G-5		
C-5	IC143	G-4		
C-15	IC144	G-3		
C-15	IC145	G-2		
C-14	IC146	G-1		
C-12	IC147	G-1		



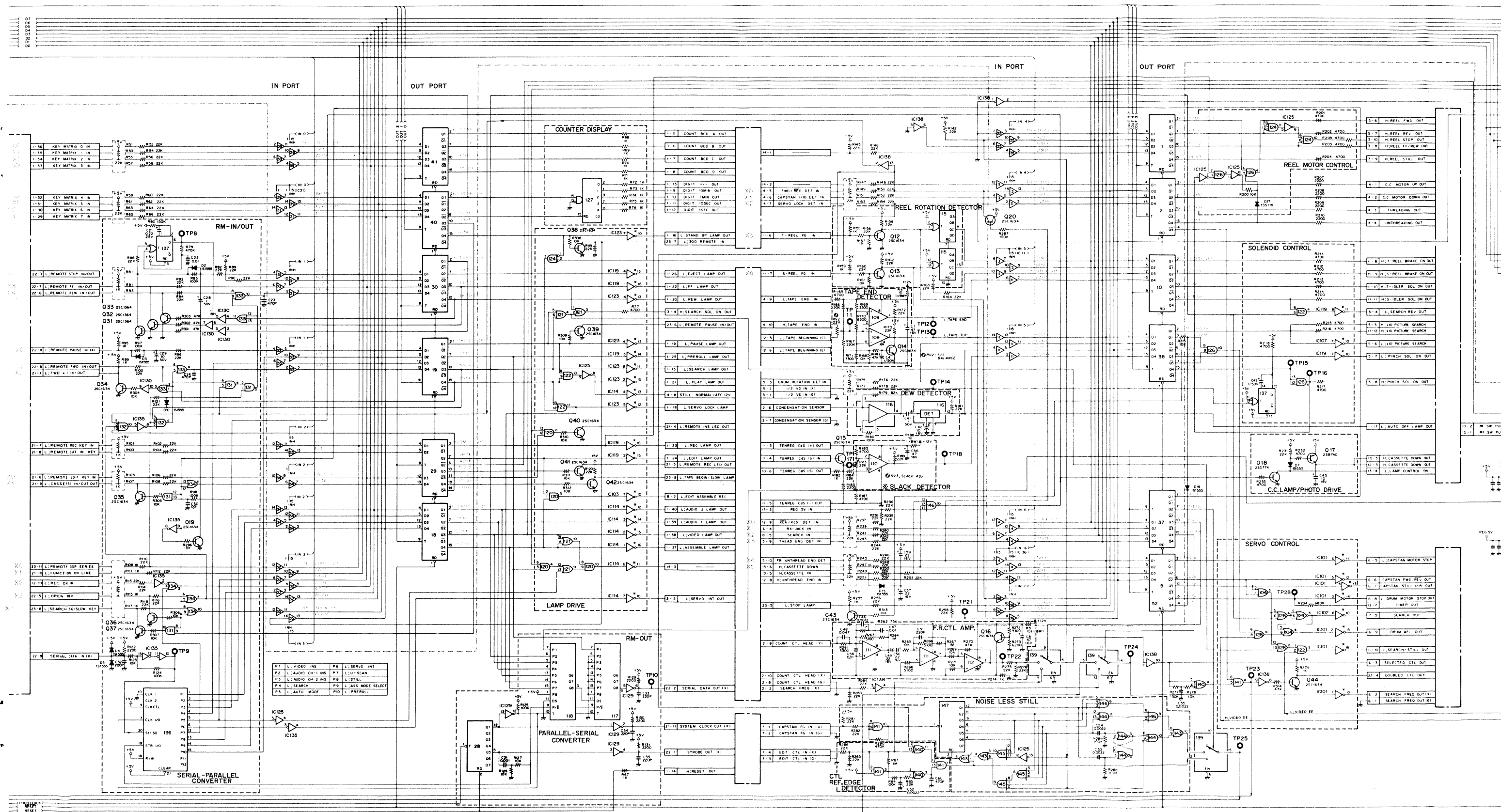
CM-13
-COMPONENT SIDE-



PT-9
-SOLDERING SIDE-



REF	TYPE	+12V	+5V	GND	REF	TYPE	+12V	+5V	GND	REF	TYPE	+12V	+5V	GND	REF	TYPE	+12V	+5V	GND
IC1	TC4017BP	16	8		IC24	271656RE10	24	12		IC106	TC4069UBP	14	7		IC129	SN74LS04N	14	7	
IC2	TC4017BP	16	8		IC25	271656RE2E	24	12		IC107	TC4528BP	16	8		IC130	MC145038CP	16	8	
IC3	MC145038CP	16	8		IC26	271656RE3E	24	12		IC108	M54517P	14	7		IC131	TC4081BP	14	7	
IC4	MC145038CP	16	8		IC27	SN74LS139N	20	10		IC109	NUM2903D	14	7		IC132	TC4078BP	14	7	
IC5	TC4017BP	16	8		IC28	TC4028BP	14	7		IC110	NUM2903D	14	7		IC133	TC4078BP	14	7	
IC6	TC4017BP	16	8		IC29	TC40175BP	16	8		IC111	NUM4558D-D	14	7		IC134	TC4078BP	14	7	
IC7	TC4017BP	16	8		IC30	TC40175BP	16	8		IC112	µPC4558C	14	7		IC135	TC4069UBP	14	7	
IC8	TC4017BP	16	8		IC31	MC145038CP	16	8		IC113	MC145038CP	16	8		IC136	MBB747	22	11	
IC9	TC4017BP	16	8		IC32	MC145038CP	16	8		IC114	M54517P	14	7		IC137	TC4528BP	16	8	
IC10	TC4017BP	16	8		IC33	MC145038CP	16	8		IC115	TC4528BP	16	8		IC138	TC4069UBP	14	7	
IC11	MC145038CP	16	8		IC34	MC145038CP	16	8		IC116	BA343	13	7		IC139	TC4058BP	16	8	
IC12	TC40402BP	14	7		IC35	MC145038CP	16	8		IC117	TC4021BP	16	8		IC140	TC4030BP	14	7	
IC13	TC40402BP	16	8		IC36	MC145038CP	16	8		IC118	TC4021BP	16	8		IC141	TC4081BP	14	7	
IC14	SN74LS139N	16	8		IC37	TC40175BP	16	8		IC119	M54517P	14	7		IC142	HD4558BP	16	8	
IC15	SN74LS139N	16	8		IC38	TC40175BP	16	8		IC120	TC4081BP	14	7		IC143	TC4078BP	14	7	
IC16	µPD444C	18	9		IC39	MC145038CP	16	8		IC121	TC4078BP	14	7		IC144	TC4081BP	14	7	
IC17	µPD444C	18	9		IC40	TC40175BP	16	8		IC122	TC4081BP	14	7		IC145	TC4078BP	14	7	
IC18	TC4017BP	16	8		IC41	TC40175BP	16	8		IC123	M54517P	14	7		IC146	TC4078BP	14	7	
IC19	TC4017BP	16	8		IC42	M54517P	14	7		IC124	TC4058BP	14	7		IC147	TC4028BP	14	7	
IC20	SN74LS139N	16	8		IC43	TC4069UBP	14	7		IC125	TC4069UBP	14	7						
IC21	SN74LS139N	16	8		IC44	TC4081BP	14	7		IC126	TC4081BP	14	7						
IC22	LH0082	24	5		IC45	TC4022BP	16	8		IC127	TC4022BP	16	8						
IC23	LH0082	11	25		IC46	TC4078BP	14	7		IC128	TC4078BP	14	7						

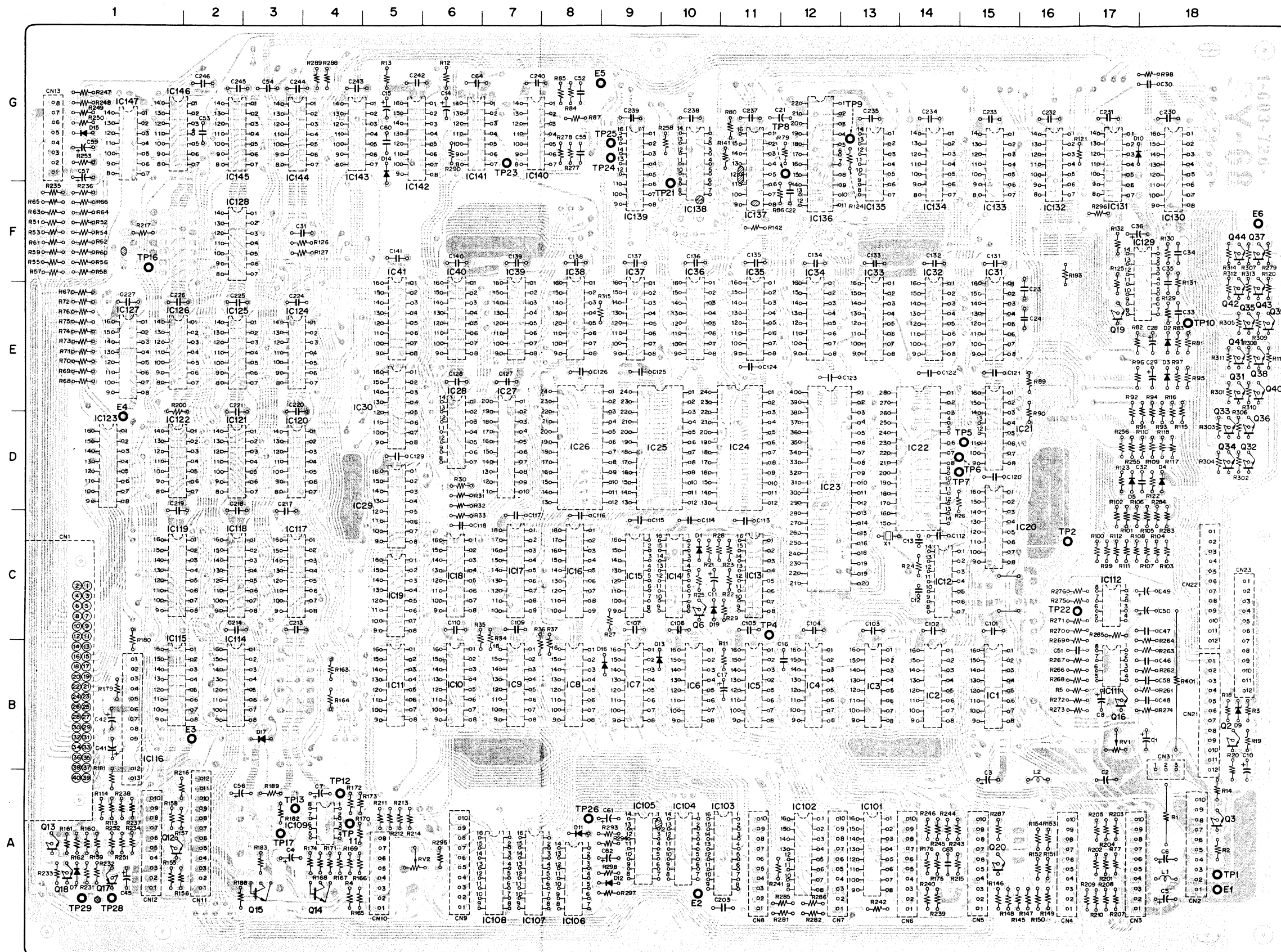




The shaded and  -marked components are critical to safety.
Replace only with same components as specified.

SY-68 (SYSTEM CONTROL)
PT-9

S/N 10891 ~ 19910 (USA)
S/N 20111 ~ 20710 (CND)



CN1	B-1	IC25	D-9	Q2	B-1
CN2	A-18	IC26	D-8	Q3	B-1
CN3	A-18	IC27	D-7	Q6	C-1
CN4	A-16	IC28	D-6	Q12	A-1
CN5	A-15	IC29	D-5	Q13	A-1
CN6	A-13	IC30	D-5	Q14	A-1
CN7	A-12	IC31	E-15	Q15	A-1
CN8	A-11	IC32	E-14	Q16	B-1
CN9	A-6	IC33	E-13	Q17	A-1
CN10	A-5	IC34	E-12	Q18	A-1
CN11	A-2	IC35	E-11	Q19	E-1
CN12	A-1	IC36	E-10	Q20	A-1
CN13	G-1	IC37	E-9	Q31	E-1
CN21	B-18	IC38	E-8	Q32	D-1
CN22	C-18	IC39	E-7	Q33	C-1
CN23	C-18	IC40	E-6	Q34	D-1
CN31	B-18	IC41	E-5	Q35	E-1
D1	C-10	IC101	A-13	Q36	D-1
D2	E-18	IC102	A-12	Q37	F-1
D3	E-18	IC103	A-10	Q38	E-1
D4	D-18	IC104	A-10	Q39	E-1
D5	D-18	IC105	A-9	Q40	E-1
D6	D-18	IC106	A-8	Q41	E-1
D7	A-1	IC107	A-7	Q42	E-1
D8	B-18	IC108	A-7	Q43	E-1
D9	F-18	IC109	A-4	Q44	F-1
D10	F-18	IC110	B-17		
D11	A-8	IC111	B-17		
D12	A-9	IC112	B-17		
D13	B-9	IC113	B-2		
D14	F-5	IC114	B-1		
D15	G-1	IC115	B-1		
D16	B-8	IC116	B-1		
D17	B-3	IC117	C-3		
		IC118	C-2		
		IC119	C-1		
E1	A-18	IC120	D-1		
E2	A-10	IC121	D-2		
E3	B-1	IC122	D-1		
E4	D-1	IC123	D-1		
E5	G-6	IC124	E-3		
E6	F-18	IC125	E-2		
		IC126	E-1		
		IC127	E-1		
		IC128	F-2		
		IC129	F-18		
		IC130	G-18		
		IC131	G-17		
		IC132	G-16		
		IC133	G-15		
		IC134	G-14		
		IC135	G-13		
		IC136	G-12		
		IC137	G-11		
		IC138	G-10		
		IC139	G-9		
		IC140	G-7		
		IC141	G-6		
		IC142	G-5		
		IC143	G-4		
		IC144	G-3		
		IC145	G-2		
		IC146	G-1		
		IC147	G-1		
IC1	B-15				
IC2	B-14				
IC3	B-13				
IC4	B-12				
IC5	B-11				
IC6	B-10				
IC7	B-9				
IC8	B-8				
IC9	B-7				
IC10	B-6				
IC11	B-5				
IC12	C-14				
IC13	C-11				
IC14	C-10				
IC15	C-9				
IC16	C-8				
IC17	C-7				
IC18	C-6				
IC19	C-5				
IC20	D-15				
IC21	D-15				
IC22	D-14				
IC23	D-12				
IC24	D-11				
TP1	A-4				
TP2	C-1				
TP3	C-1				
TP4	C-1				
TP5	D-1				
TP6	D-1				
TP7	D-1				
TP8	G-1				
TP9	G-1				
TP10	E-1				
TP11	A-4				
TP12	A-3				
TP13	A-3				
TP14	F-1				
TP15	F-1				
TP16	F-1				
TP17	F-1				
TP18	F-1				
TP19	G-1				
TP20	E-1				
TP21	A-4				
TP22	G-9				
TP23	G-9				
TP24	G-9				
TP25	G-9				
TP26	A-8				
TP27	A-1				
TP28	A-1				
TP29	A-1				
X1	C-14				

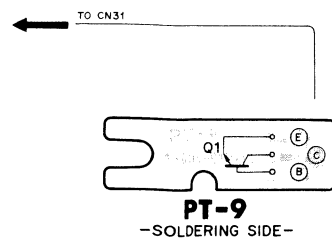
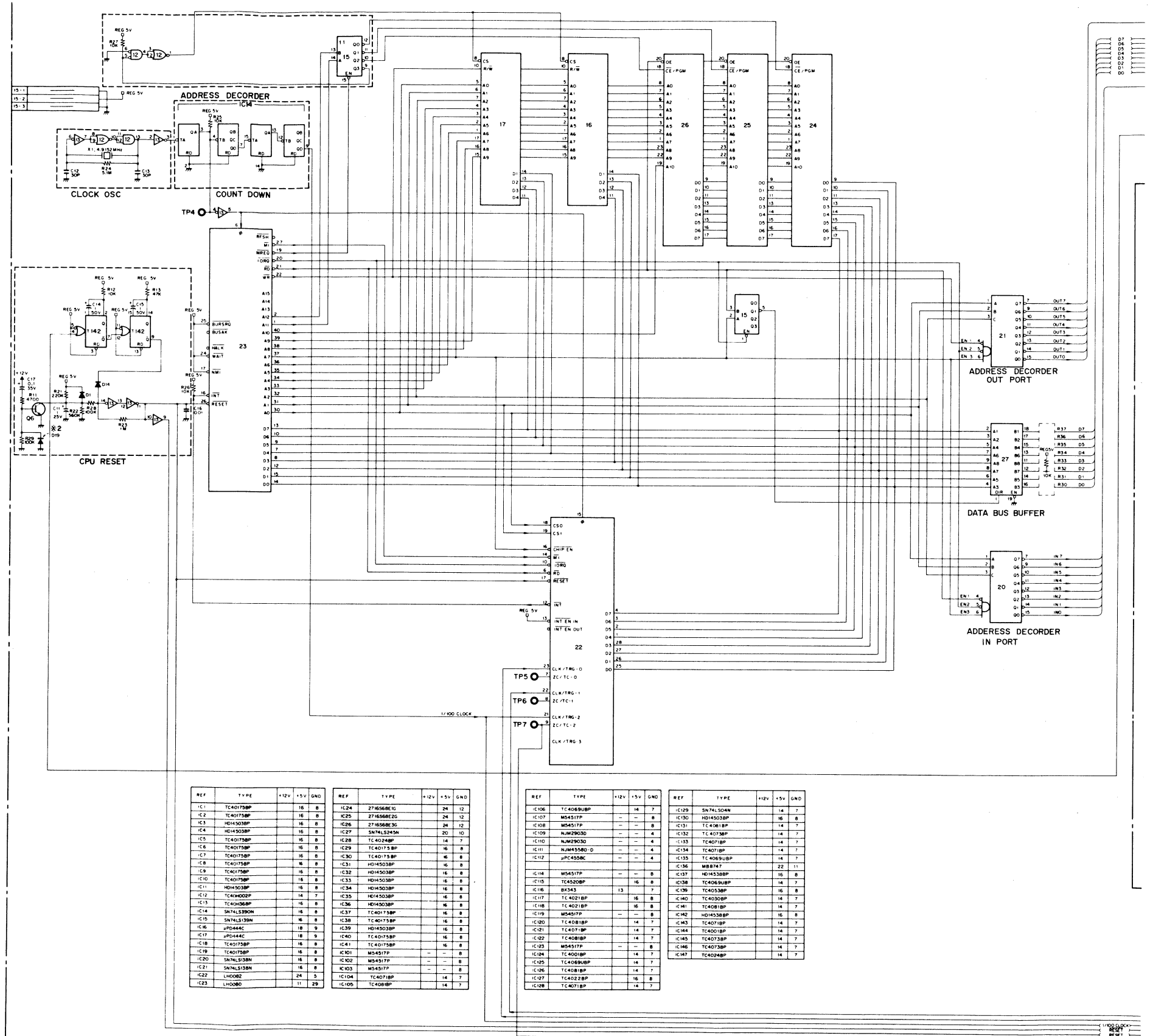


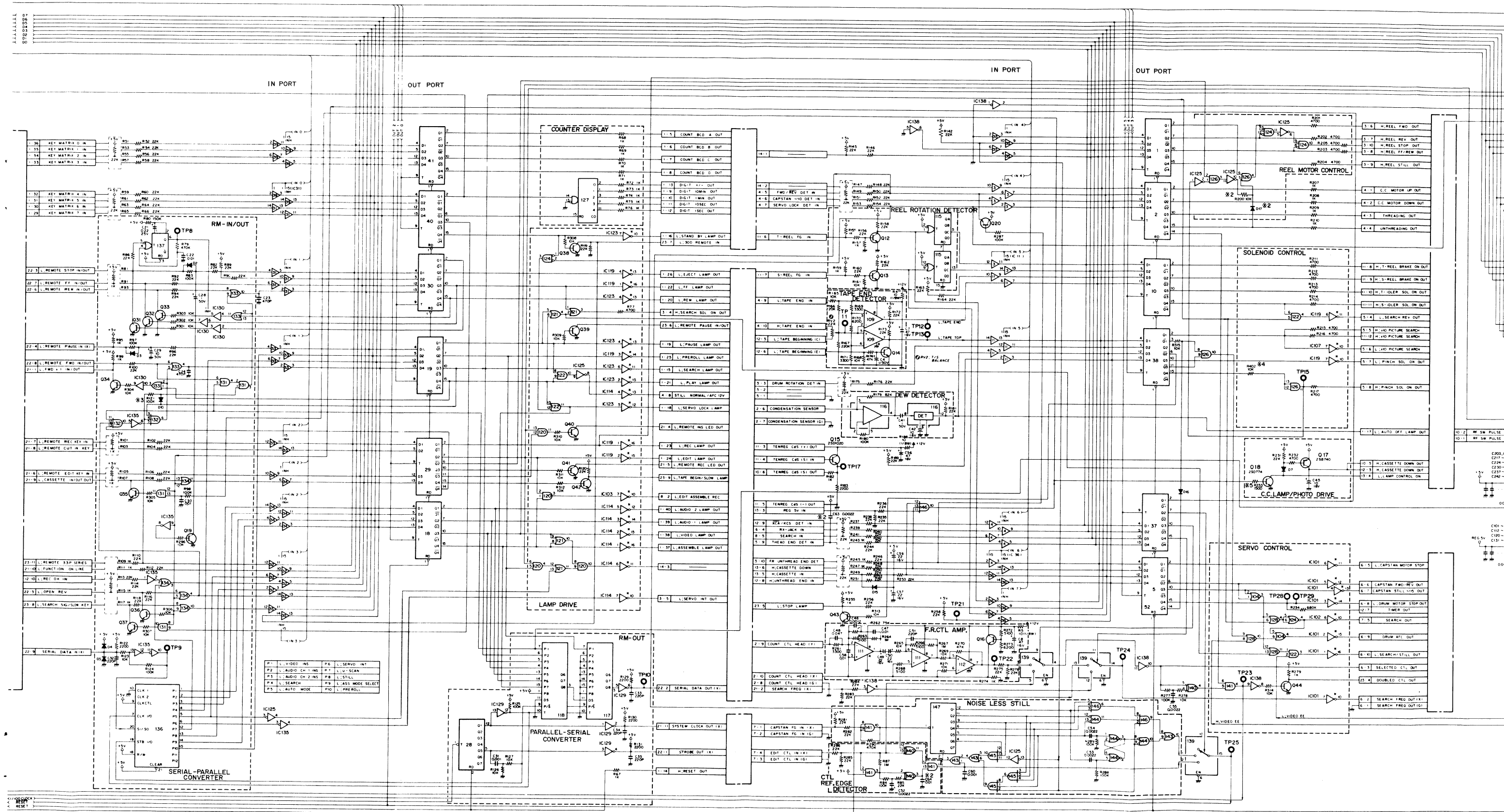
SY-68 -SOLDERING SIDE-

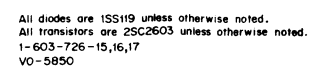
SY-68 (SYSTEM CONTROL)
PT-9S/N 11591 ~ 19910 (USA)
S/N 20211 ~ 20710 (CND)

CN1	B - 1	IC25	D - 9	Q2	B - 18
CN2	A - 18	IC26	D - 8	Q3	B - 18
CN3	A - 18	IC27	D - 7	Q6	C - 10
CN4	A - 16	IC28	D - 6	Q12	A - 1
CN5	A - 15	IC29	D - 5	Q13	A - 1
CN6	A - 13	IC30	D - 5	Q14	A - 4
CN7	A - 12	IC31	E - 15	Q15	A - 3
CN8	A - 11	IC32	E - 14	Q16	B - 17
CN9	A - 6	IC33	E - 13	Q17	A - 1
CN10	A - 5	IC34	E - 12	Q18	A - 1
CN11	A - 2	IC35	E - 11	Q19	E - 17
CN12	A - 1	IC36	E - 10	Q20	A - 15
CN13	G - 1	IC37	E - 9	Q31	E - 18
CN21	B - 18	IC38	E - 8	Q32	D - 18
CN22	C - 18	IC39	E - 7	Q33	D - 18
CN23	C - 18	IC40	E - 6	Q34	D - 18
CN31	B - 18	IC41	E - 5	Q35	E - 18
		IC101	A - 13	Q36	D - 18
D1	C - 10	IC102	A - 12	Q37	F - 18
D2	E - 18	IC103	A - 10	Q38	E - 18
D3	E - 18	IC104	A - 10	Q39	E - 18
D4	D - 18	IC105	A - 9	Q40	E - 18
D5	D - 18	IC106	A - 8	Q41	E - 18
D7	A - 1	IC107	A - 7	Q42	E - 18
D9	B - 18	IC108	A - 7	Q43	E - 18
D10	F - 18	IC109	A - 4	Q44	F - 18
D11	A - 8	IC111	B - 17	RV1	B - 18
D12	A - 9	IC112	B - 17	RV2	A - 5
D13	B - 9	IC114	B - 2		
D14	F - 5	IC115	B - 1	TP1	A - 18
D15	G - 1	IC116	B - 1	TP2	C - 16
D16	B - 8	IC117	C - 3	TP4	C - 11
D17	B - 3	IC118	C - 2	TP5	D - 14
		IC119	C - 1	TP6	D - 14
E1	A - 18	IC120	D - 3	TP7	D - 14
E2	A - 10	IC121	D - 2	TP8	F - 11
E3	B - 1	IC122	D - 1	TP9	G - 13
E4	D - 1	IC123	D - 1	TP10	E - 18
E5	G - 6	IC124	E - 3	TP11	A - 4
E6	F - 18	IC125	E - 2	TP12	A - 4
		IC126	E - 1	TP13	A - 3
IC1	B - 15	IC127	E - 1	TP16	F - 1
IC2	B - 14	IC128	F - 2	TP17	A - 3
IC3	B - 13	IC129	F - 18	TP21	F - 10
IC4	B - 12	IC130	G - 18	TP22	C - 16
IC5	B - 11	IC131	G - 17	TP23	G - 7
IC6	B - 10	IC132	G - 16	TP24	G - 9
IC7	B - 9	IC133	G - 15	TP25	G - 9
IC8	B - 8	IC134	G - 14	TP26	A - 8
IC9	B - 7	IC135	G - 13	TP28	A - 1
IC10	B - 6	IC136	G - 12	TP29	A - 1
IC11	B - 5	IC137	G - 11		
IC12	C - 14	IC138	G - 10	X1	C - 14
IC13	C - 11	IC139	G - 9		
IC14	C - 10	IC140	G - 7		
IC15	C - 9	IC141	G - 6		
IC16	C - 8	IC142	G - 5		
IC17	C - 7	IC143	G - 4		
IC18	C - 6	IC144	G - 3		
IC19	C - 5	IC145	G - 2		
IC20	D - 15	IC146	G - 1		
IC21	D - 15	IC147	G - 1		
IC22	D - 14				
IC23	D - 12				
IC24	D - 11				

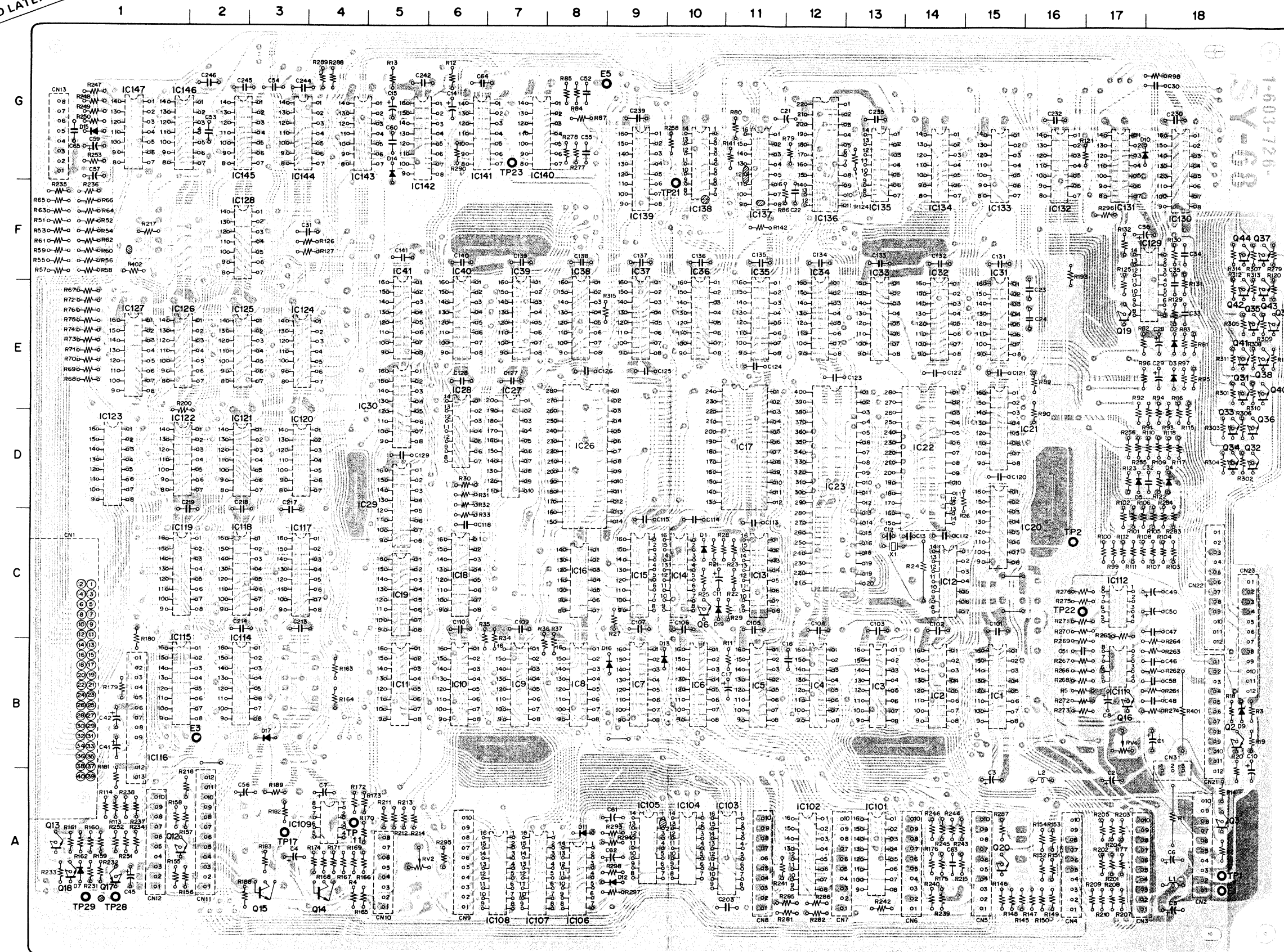
MARK	CHANGE INFORMATION	SERIAL NO.
X1	R2 750 - 430	USA 11591 ~ CND 20211 ~ J 10201 ~
X2	Q63 0.0022 ADDED Q64 0.01 ADDED C221 0.01 DELETED C241 0.01 DELETED D17 15S119 ADDED IC110 NUM29030 DELETED Q7 25A733A - 25A1115 Q6 25C1310 - 25C2603 Q15 25C1634 - 25D1020 R184 22K DELETED R185 4700 DELETED R200 10K ADDED RV3 22K DELETED	USA 12791 ~ CND 20211 ~ J 10301 ~
X3	R121 22K - 100K IC24 271658BE1D - E1F IC25 271658BE2E - E2F IC26 271658BE3E - E3F	USA 13891 ~ CND 20611 ~ J 10551 ~
X4	Q61 1.50V - 3.350V R402 10K ADDED CHANGED CONNECTION FORMER	USA 16211 ~ CND 20611 ~ J 11151 ~
X5	R233 4700 - 1500	USA 16961 ~ CND 20661 ~ J 11151 ~
X6	IC24 271658BE1F - E1G IC25 271658BE2F - E2G IC26 271658BE3F - E3G	USA 17511 ~ CND 20661 ~ J 11301 ~



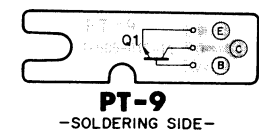




14-80 (c)

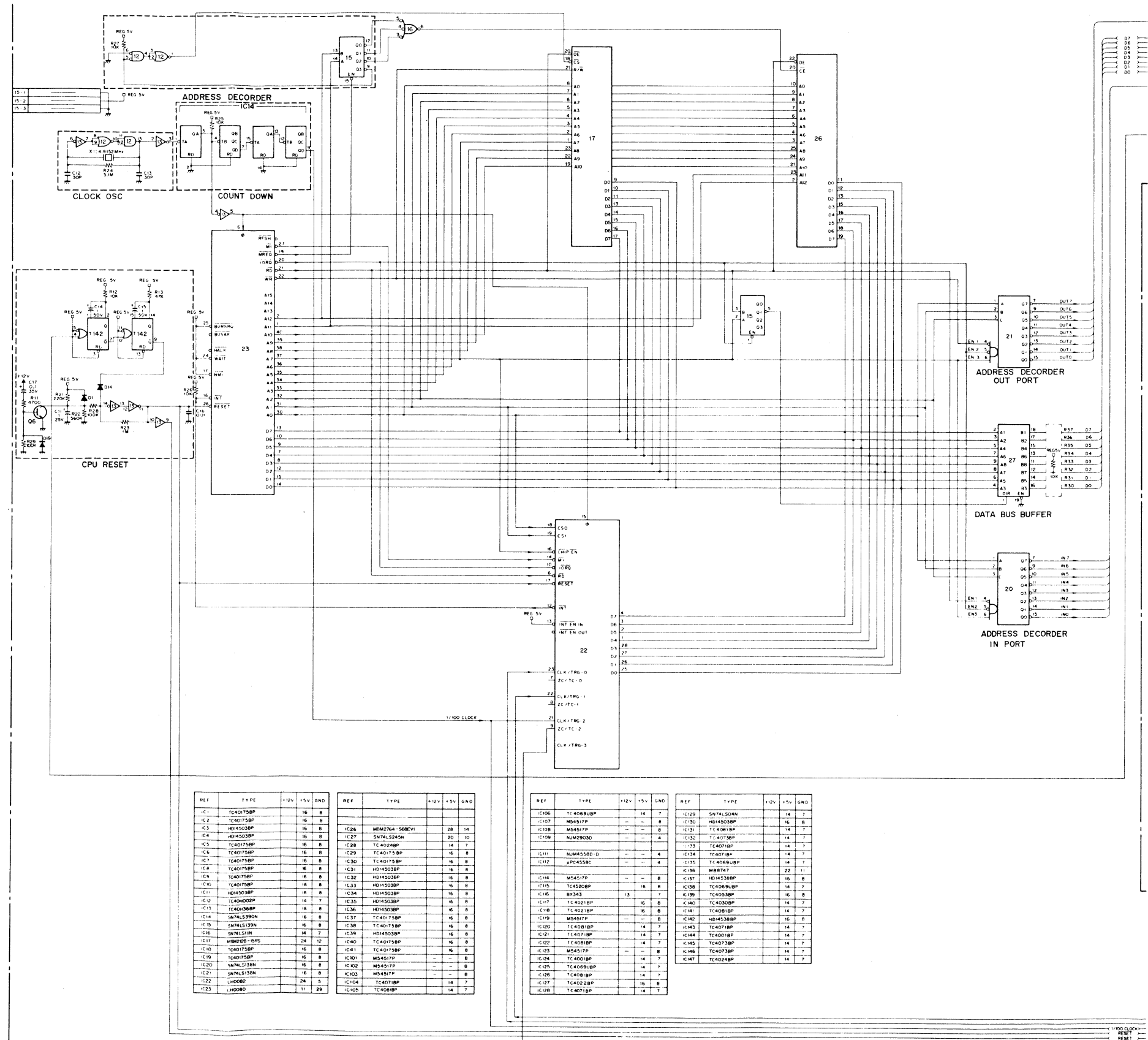
SY-68 (SYSTEM CONTROL)
PT-9SY-68 (SYSTEM
PT-9S/N 19911 AND LATER (USA)
S/N 20711 AND LATER (CND)S/N 19911 AND L
S/N 20711 AND L

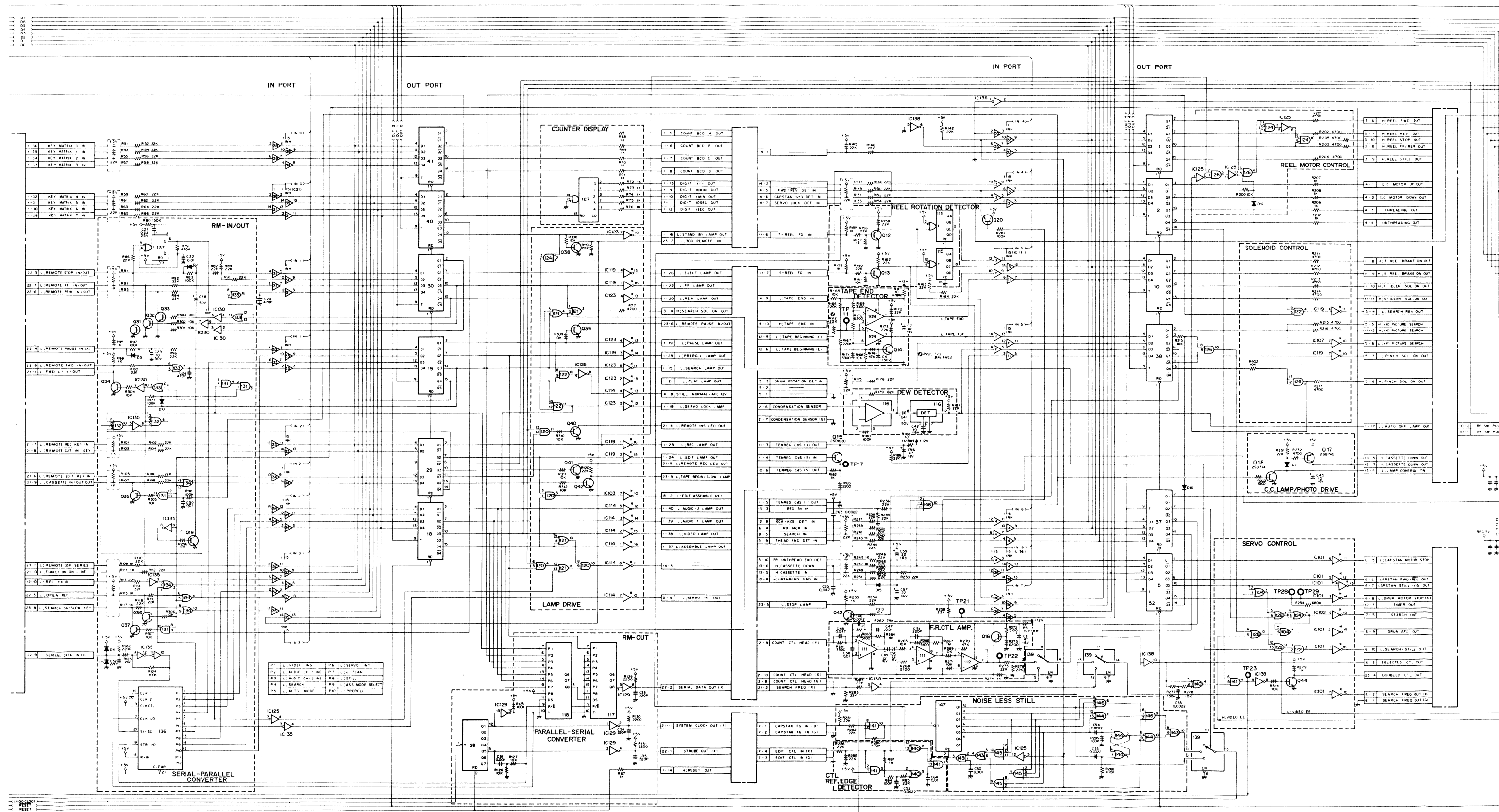
CN1	B-1	IC26	D-8	Q2	B-18
CN2	A-18	IC27	D-7	Q3	B-18
CN3	A-18	IC28	D-6	Q6	C-10
CN4	A-16	IC29	D-5	Q12	A-1
CN5	A-15	IC30	D-5	Q13	A-1
CN6	A-13	IC31	E-15	Q14	A-4
CN7	A-12	IC32	E-14	Q15	A-3
CN8	A-11	IC33	E-13	Q16	B-17
CN9	A-6	IC34	E-12	Q17	A-1
CN10	A-5	IC35	E-11	Q18	A-1
CN11	A-2	IC36	E-10	Q19	E-17
CN12	A-1	IC37	E-9	Q20	A-15
CN13	G-1	IC38	E-8	Q31	E-18
CN21	B-18	IC39	E-7	Q32	D-18
CN22	C-18	IC40	E-6	Q33	D-18
CN23	C-18	IC41	E-5	Q34	D-18
CN31	B-18	IC101	A-13	Q35	E-18
		IC102	A-12	Q36	D-18
		IC103	A-10	Q37	F-18
		IC104	A-10	Q38	E-18
		IC105	A-9	Q39	E-18
		IC106	A-8	Q40	E-18
		IC107	A-7	Q41	E-18
		IC108	A-7	Q42	E-18
		IC109	A-4	Q43	E-18
		IC111	B-17	Q44	F-18
		IC112	B-17		
		IC114	B-2	RV1	B-18
		IC115	B-1	RV2	A-5
		IC116	B-1		
		IC117	C-3	TP1	A-18
		IC118	C-2	TP2	C-16
		IC119	C-1	TP11	A-4
		IC120	C-3	TP17	A-3
		IC121	D-2	TP21	F-10
		IC122	D-1	TP22	C-16
		IC123	D-1	TP23	G-7
		IC124	E-3	TP28	A-1
		IC125	E-2	TP29	A-1
		IC126	E-1		
		IC127	E-1	X1	C-14
		IC128	F-2		
		IC129	F-18		
		IC130	G-18		
		IC131	G-17		
		IC132	G-16		
		IC133	G-15		
		IC134	G-14		
		IC135	G-13		
		IC136	G-12		
		IC137	G-11		
		IC138	G-10		
		IC139	G-9		
		IC140	G-7		
		IC141	G-6		
		IC142	G-5		
		IC143	G-4		
		IC144	G-3		
		IC145	G-2		
		IC146	G-1		
		IC147	G-1		

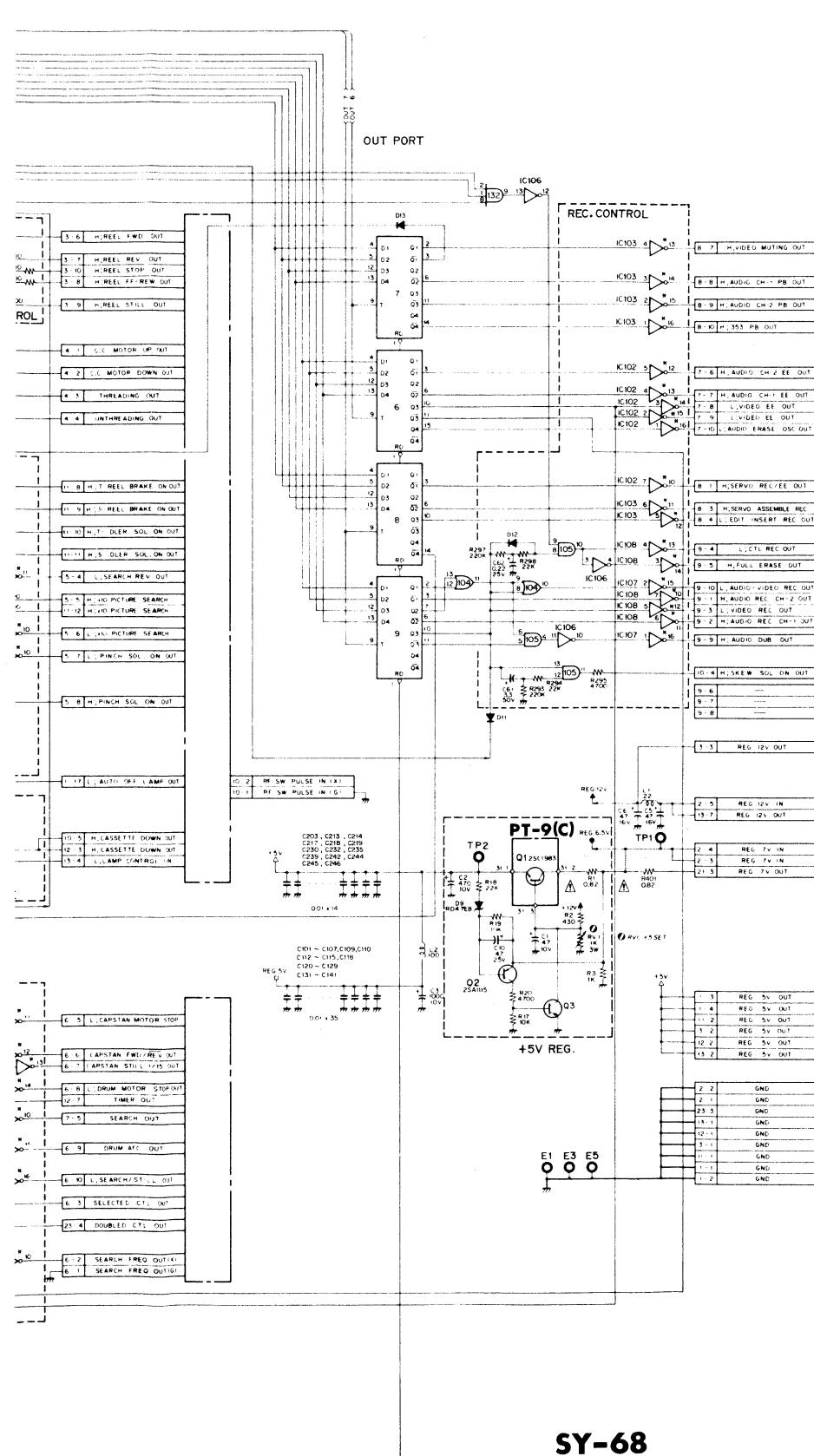
SY-68 - SOLDERING SIDE-
1-603-726-18
VO-5850

SY-68 (SYSTEM CONTROL)
PT-9S/N 19911 AND LATER (USA)
S/N 20711 AND LATER (CND)

IC26	D-8	Q2	B-18
IC27	D-7	Q3	B-18
IC28	D-6	Q6	C-10
IC29	D-5	Q12	A-1
IC30	D-5	Q13	A-1
IC31	E-15	Q14	A-4
IC32	E-14	Q15	A-3
IC33	E-13	Q16	B-17
IC34	E-12	Q17	A-1
IC35	E-11	Q18	A-1
IC36	E-10	Q19	E-17
IC37	E-9	Q20	A-15
IC38	E-8	Q31	E-18
IC39	E-7	Q32	D-18
IC40	E-6	Q33	D-18
IC41	E-5	Q34	D-18
IC101	A-13	Q35	E-18
IC102	A-12	Q36	D-18
IC103	A-10	Q37	F-18
IC104	A-10	Q38	E-18
IC105	A-9	Q39	E-18
IC106	A-8	Q40	E-18
IC107	A-7	Q41	E-18
IC108	A-7	Q42	E-18
IC109	A-4	Q43	E-18
IC111	B-17	Q44	F-18
IC112	B-17		
IC114	B-2	RV1	B-18
IC115	B-1	RV2	A-5
IC116	B-1		
IC117	C-3	TP1	A-18
IC118	C-2	TP2	C-16
IC119	C-1	TP11	A-4
IC120	D-3	TP17	A-3
IC121	D-2	TP21	F-10
IC122	D-1	TP22	C-16
IC123	D-1	TP23	G-7
IC124	E-3	TP28	A-1
IC125	E-2	TP29	A-1
IC126	E-1		
IC127	E-1	X1	C-14
IC128	F-2		
IC129	F-18		
IC130	G-18		
IC131	G-17		
IC132	G-16		
IC133	G-15		
IC134	G-14		
IC135	G-13		
IC136	G-12		
IC137	G-11		
IC138	G-10		
IC139	G-9		
IC140	G-7		
IC141	G-6		
IC142	G-5		
IC143	G-4		
IC144	G-3		
IC145	G-2		
IC146	G-1		
IC147	G-1		



SY-68 (SYSTEM CONTROL)
PT-9



SY-68

All diodes are 1SS119 unless otherwise noted.
All transistors are 2SC2603 unless otherwise noted.
1-603-726-18
VO-5850

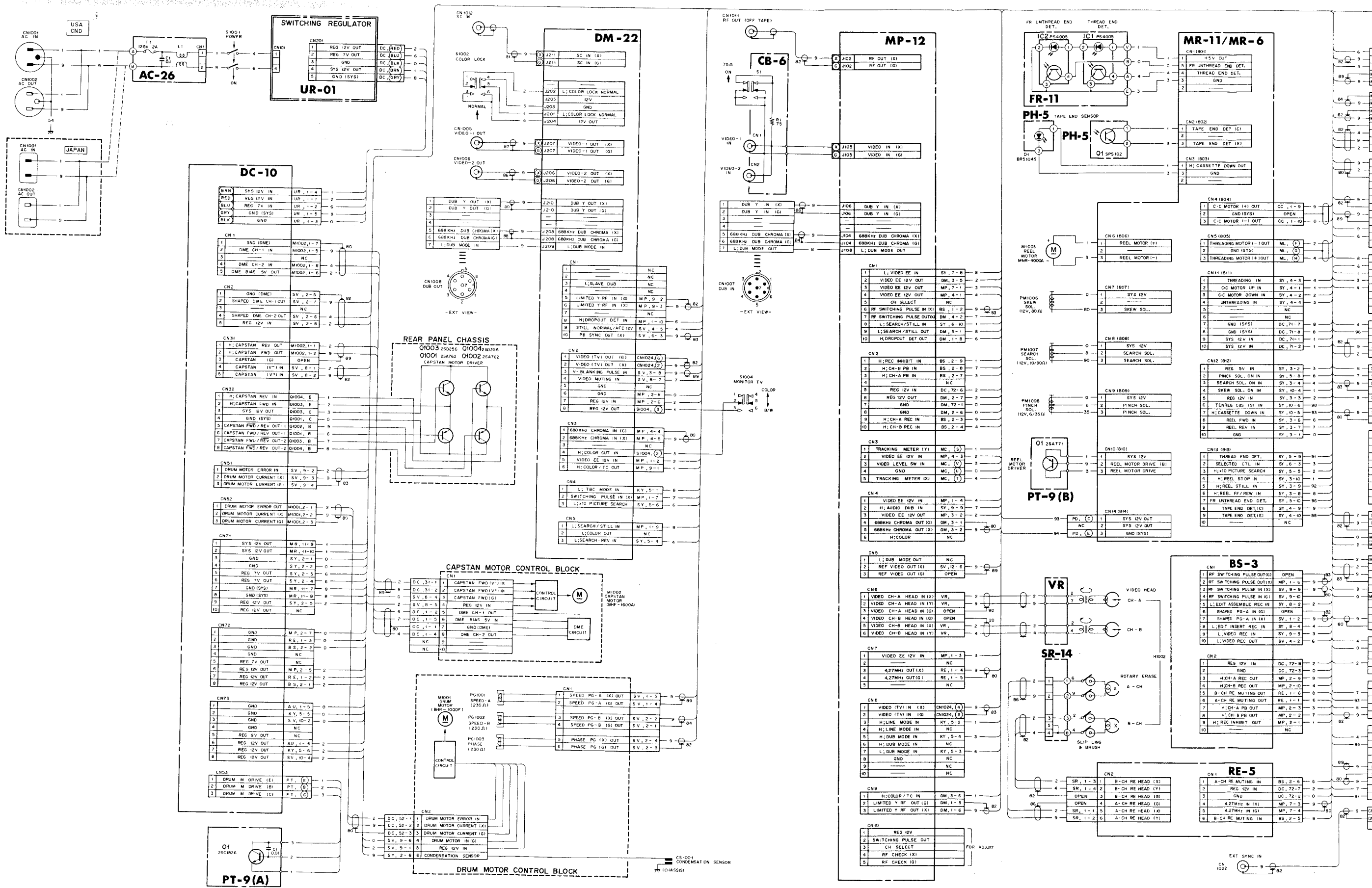
14-79 (d)

NOTE: The shaded and -marked components are critical to safety.
Replace only with same components as specified.

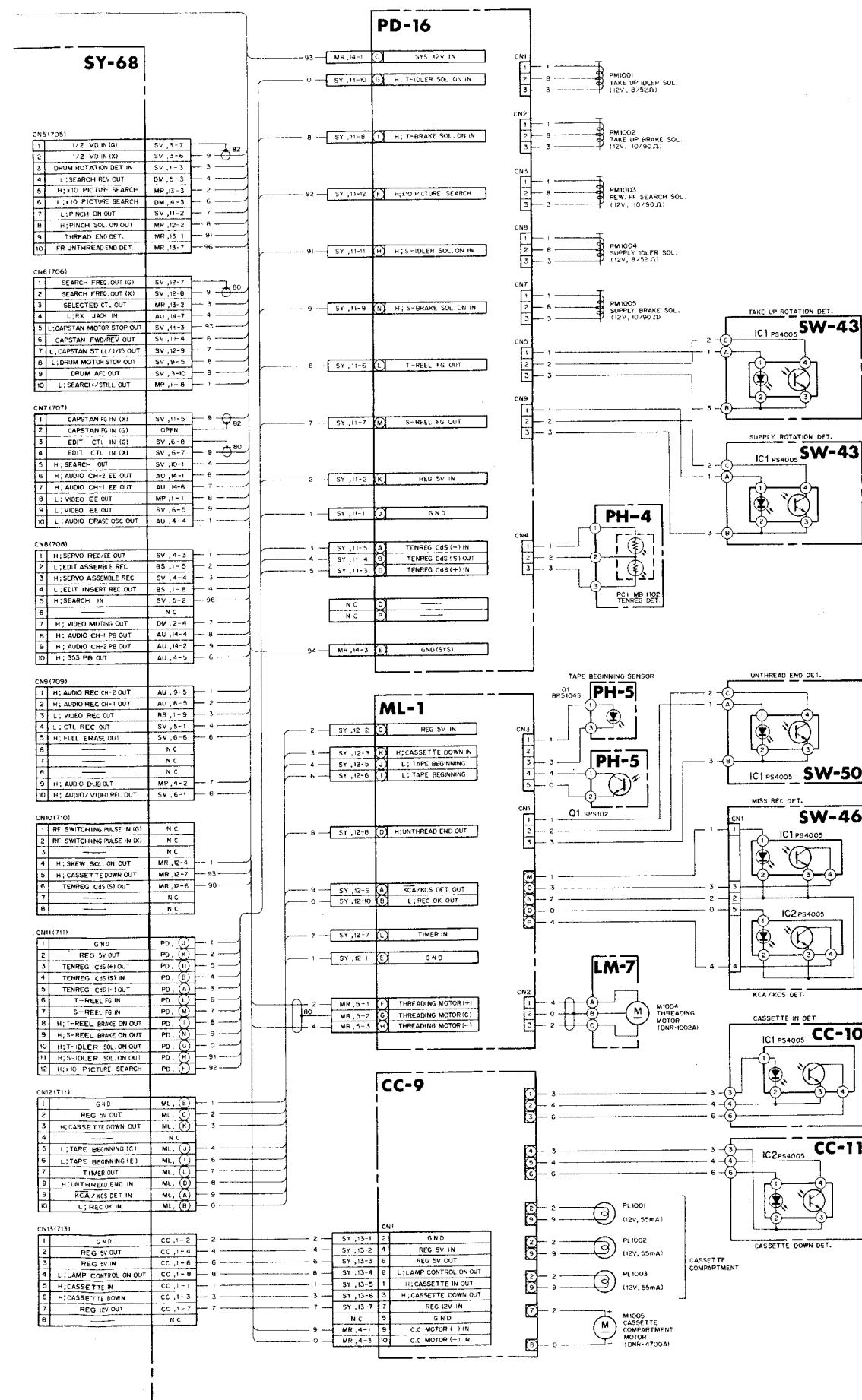
14-80 (d)

ADDED '84. 3

FRAME







SECTION 15
SPARE PARTS AND FIXTURE

15-1. PARTS INFORMATION

1. Safety Related Component Warning
Components identified by shading marked with on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service bulletins and service manual supplements published by Sony.
2. Replacement Parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which actually in use. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts."
- This manual's exploded views and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present".
 - Regarding engineering parts changes in our engineering department, refer Sony service bulletins and service manual supplements.
3. Printed Components in Bold-Face type on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The remaining parts are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
4. Item with no part number and/or no description are not stocked because they are seldom required for routine service.
5. (T) after a spring description is shown on the exploded views in order to indicate the number of a spring turn required for the use.
(Example) Spring, tension (24T); This spring must be cut at its 24th turn for actual use.

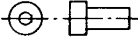
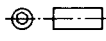
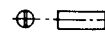
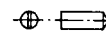
15-2. EXPLODED VIEW

- Exploded views are composed of the following blocks.
- (1) Reel Chassis (1)
Supply reel table
Supply tension regulator arm
Search solenoid
Skew solenoid
Supply main brake
Reel motor
- (2) Reel Chassis (2)
Take-up reel table
FF/REW idler
Take-up main brake
Take-up tension regulator arm
R brake
Still/miss-rec. detector
- (3) Reel Chassis (3)
Supply idler solenoid
Take-up idler solenoid
FF/REW idler pulley
Supply brake solenoid
Take-up brake solenoid
10 times picture search solenoid
- (4) Threading
Threading ring
Gear box
T correction guide
Tape beginning sensor
FR detector
- (5) Threading Arm
T drawer arm
S drawer arm
Drawer lever
- (6) Drum/Capstan
Head drum
Capstan motor
Audio/CTL head
Brush
- (7) Erase Head Base
Erase head base
S guard
- (8) Pinch Lever
Pinch lever
Pinch roller pre-set cam
Pinch solenoid
- (9) Cassette-up Compartment
- (10) Function Control
Function control panel (except ornamental panel)
- (11) Chassis (1)
Chassis (bottom view)
- (12) Chassis (2)
Chassis (rear view)
- (13) Meter Panel
- (14) Chassis (3)
Chassis (top view)
- (15) Printed Circuit Board
Printed circuit board (except bottom block)
- (16) Ornamental Panel (1)
Ornamental panel (except control panel)
- (17) Ornamental Panel (2)
Control panel
- (18) Switching Regulator (UR-01)

	PS	PSW	B (BZn N)	B (Cr-N)	PTT	PTTWH
						
2.6 x 4	7-621-972-05	—	7-621-912-10	7-621-912-18	—	—
2.6 x 6	7-621-972-25	7-621-981-15	7-621-912-30	7-621-912-38	—	—
2.6 x 8	7-621-972-35	7-621-981-25	7-621-912-40	7-621-912-48	—	—
3 x 5	7-686-446-01	—	—	—	—	—
3 x 6	7-686-447-01	7-686-527-01	7-686-624-09	7-686-624-04	7-687-411-31	7-687-510-31
3 x 8	7-686-448-01	7-686-528-01	7-686-625-09	7-686-625-04	7-687-412-31	7-687-511-31
3 x 10	7-686-449-01	7-686-529-01	7-686-626-09	7-686-626-04	7-687-413-31	7-687-512-31
3 x 12	7-686-450-01	7-686-530-01	7-686-627-09	7-686-627-04	7-687-414-31	7-687-513-31
3 x 16	7-686-452-01	7-686-532-01	7-686-629-09	7-686-629-04	—	—
3 x 20	7-686-453-01	7-686-533-01	7-686-630-09	7-686-630-04	—	—
3 x 25	7-686-454-01	7-686-534-01	7-686-631-09	7-686-631-04	—	—
4 x 8	7-686-468-01	7-686-548-01	7-686-635-09	7-686-635-04	—	—
4 x 12	7-686-470-01	7-686-550-01	7-686-637-09	7-686-637-04	—	—
4 x 14	7-686-471-01	—	7-686-638-09	7-686-638-04	—	—
4 x 16	7-686-472-01	—	7-686-639-09	7-686-639-04	—	—
4 x 20	7-686-473-01	—	7-686-640-09	7-686-640-04	—	—

SCREW

WASHER

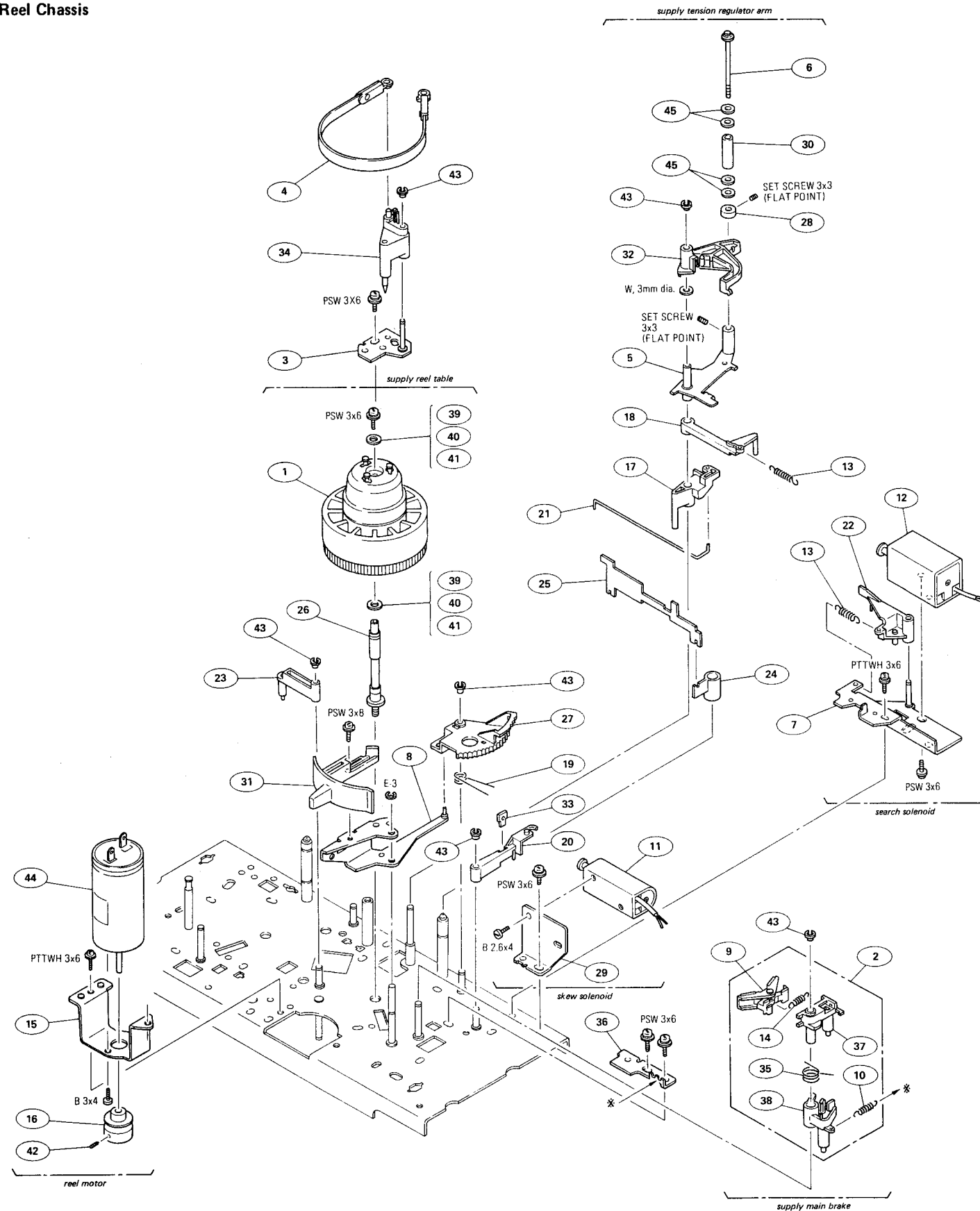
	HEXAGON SOCKET SCREW 	HEXAGON SET SCREW 	(-) SET SCREW FLAT POINT 	(-) SET SCREW CONE POINT 
2.6 x 3	_____	7-621-734-09	_____	_____
2.6 x 4	7-621-996-24	7-621-735-09	_____	_____
2.6 x 5	_____	7-621-736-09	_____	_____
2.6 x 6	7-683-412-05	_____	_____	7-621-712-55
2.6 x8	7-683-413-05	_____	_____	7-621-712-65
2.6 x 10	_____	_____	_____	7-621-712-75
3 x 4	_____	7-683-238-01	_____	_____
3 x 5	_____	_____	7-683-175-01	_____
3 x 6	7-683-403-04	_____	7-683-176-01	7-683-176-21
3 x 8	7-683-404-04	_____	_____	7-683-177-21
3 x 10	7-683-405-04	_____	_____	7-683-178-21
3 x 12	_____	_____	_____	7-683-179-21

	FLAT WASHER SMALL W. 	FLAT WASHER MIDDLE W. 	SPRING WASHER SW. 	TOOTHED WASHER TYPE B LW. 	HEXAGON NUT N. 
2.6 mm	7-688-002-01	7-688-002-12	7-623-207-22	7-623-421-07	7-622-207-05
3 mm	7-688-003-01	7-688-003-12	7-688-003-11	7-623-422-07	7-684-023-04
4 mm	7-688-004-01	7-688-004-12	7-623-210-22	7-623-423-07	7-684-024-04
5 mm	7-688-005-01	7-688-005-01	7-623-212-22	_____	7-684-025-04

	STOP RING E TYPE E. 
2	7-624-104-04
2.3	7-624-105-04
3	7-624-106-04
4	7-624-108-04
5	7-624-109-04
6	7-624-110-04

REEL CHASSIS (1) REEL CHASSIS (1)

Supply Side Reel Chassis



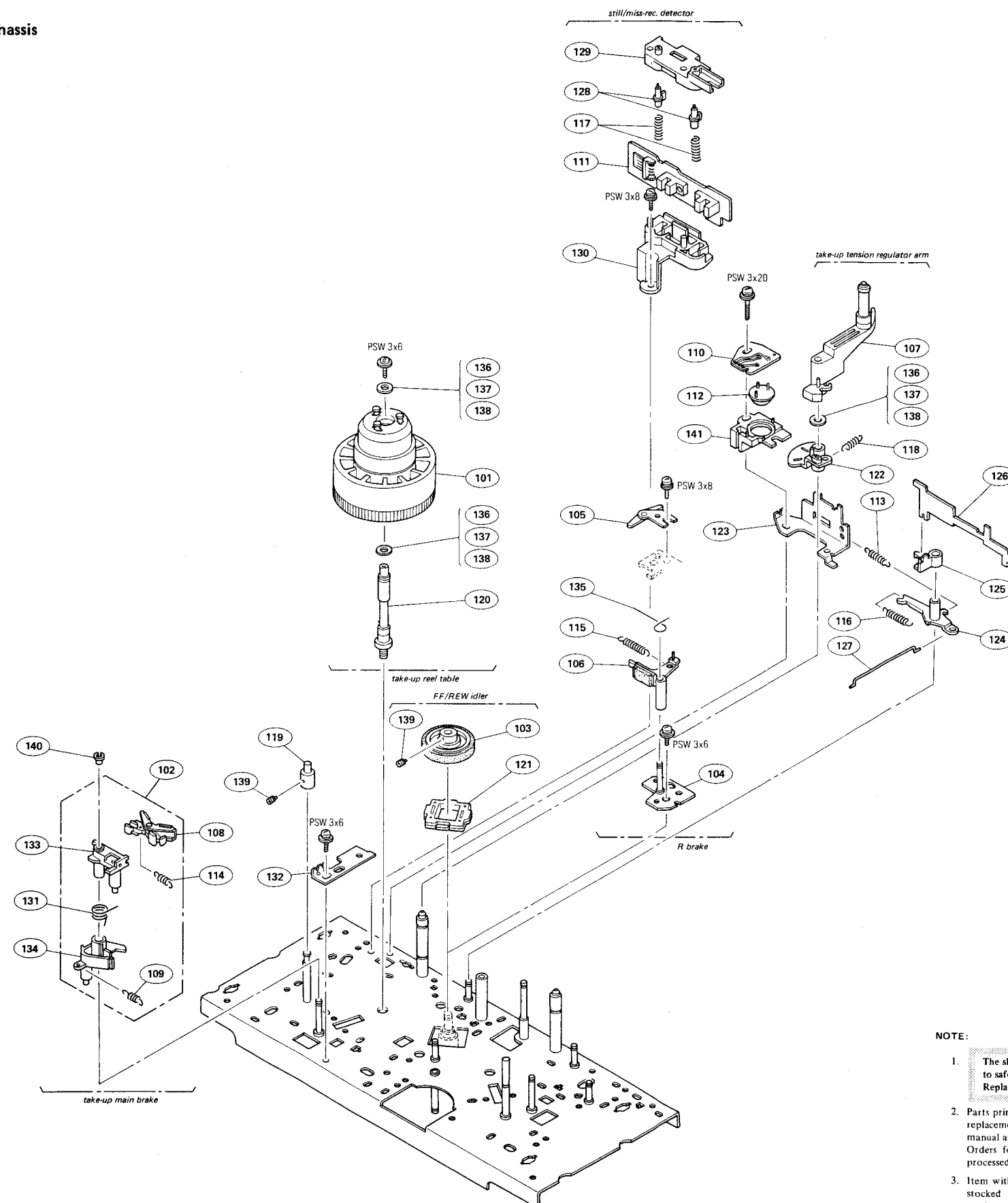
No.	Parts No.	Description
1	A-6739-016-A	TABLE ASS'Y, REEL
2	A-6741-038-B	BRAKE ASS'Y, MAIN
3	X-3668-706-0	BASE ASS'Y, S TENSION REGULATOR
4	X-3668-707-0	BAND ASS'Y, S TENSION REGULATOR
5	X-3668-708-0	ARM (A) ASS'Y, S TENSION REGULATOR
6	X-3668-709-0	SHAFT (1) ASS'Y, ROLLER
7	X-3668-717-0	BASE ASS'Y, SEARCH
8	X-3668-725-0	ARM (C) ASS'Y, SKEW
9	X-3668-749-2	HOLDER ASS'Y
10	3-535-369-XX	SPRING, TENSION (12T)
11	1-454-283-00	SOLENOID
12	1-454-284-00	SOLENOID
13	3-534-238-XX	SPRING, TENSION (23T)
14	3-548-124-00	SPRING, TENSION
15	3-668-783-00	BRACKET, MOTOR
16	3-668-784-00	PULLEY, MOTOR
17	3-668-787-00	ARM, S DETECTION
18	3-668-794-00	ARM (A), SKEW
19	3-668-795-00	SPRING
20	3-668-797-00	ARM, SKEW LOCK
21	3-668-804-00	LINK, DETECTION, TENSION
22	3-668-808-00	ARM, FWD, SEARCH
23	3-668-818-00	LEVER (A), FR
24	3-668-821-00	LEVER (D), FR
25	3-668-822-00	PLATE, CANCEL, FR
26	3-668-827-00	SHAFT (S), REEL
27	3-668-835-00	ARM (B), SKEW
28	3-668-874-00	FLANGE (1), LOWER
29	3-668-875-00	BRACKET
30	3-668-916-02	ROLLER (1), GUIDE
31	3-668-920-00	LEVER, SKEW
32	3-668-936-00	ARM (B), S TENSION REGULATOR
33	3-668-937-00	CLAW, SKEW LOCK
34	3-668-939-00	ARM, BAND LOCK
35	3-668-966-00	SPRING
36	3-668-967-00	STOPPER, BRAKE
37	3-668-970-00	ARM, BRAKE
38	3-668-971-00	ARM, BRAKE RELEASE
39	3-701-444-01	WASHER, 6MM DIA, 0.13T
40	3-701-444-11	WASHER, 6MM DIA, 0.25T
41	3-701-444-21	WASHER, 6MM DIA, 0.5T
42	3-701-506-01	SET SCREW, DOUBLE POINT 3x4
43	3-703-074-00	CAP 3, SHAFT
44	8-835-047-01	MOTOR, DC (MNR-4000A)
45	3-701-438-01	WASHER, 2.5MM DIA, 0.13T

NOTE:

- The shaded and  -marked components are critical to safety. Replace only with same components as specified.
- Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
- Item with no part number and/or no description are not stocked because they are seldom required for routine service.

REEL CHASSIS (2) REEL CHASSIS (2)

Take-up Side Reel Chassis



NOTE:

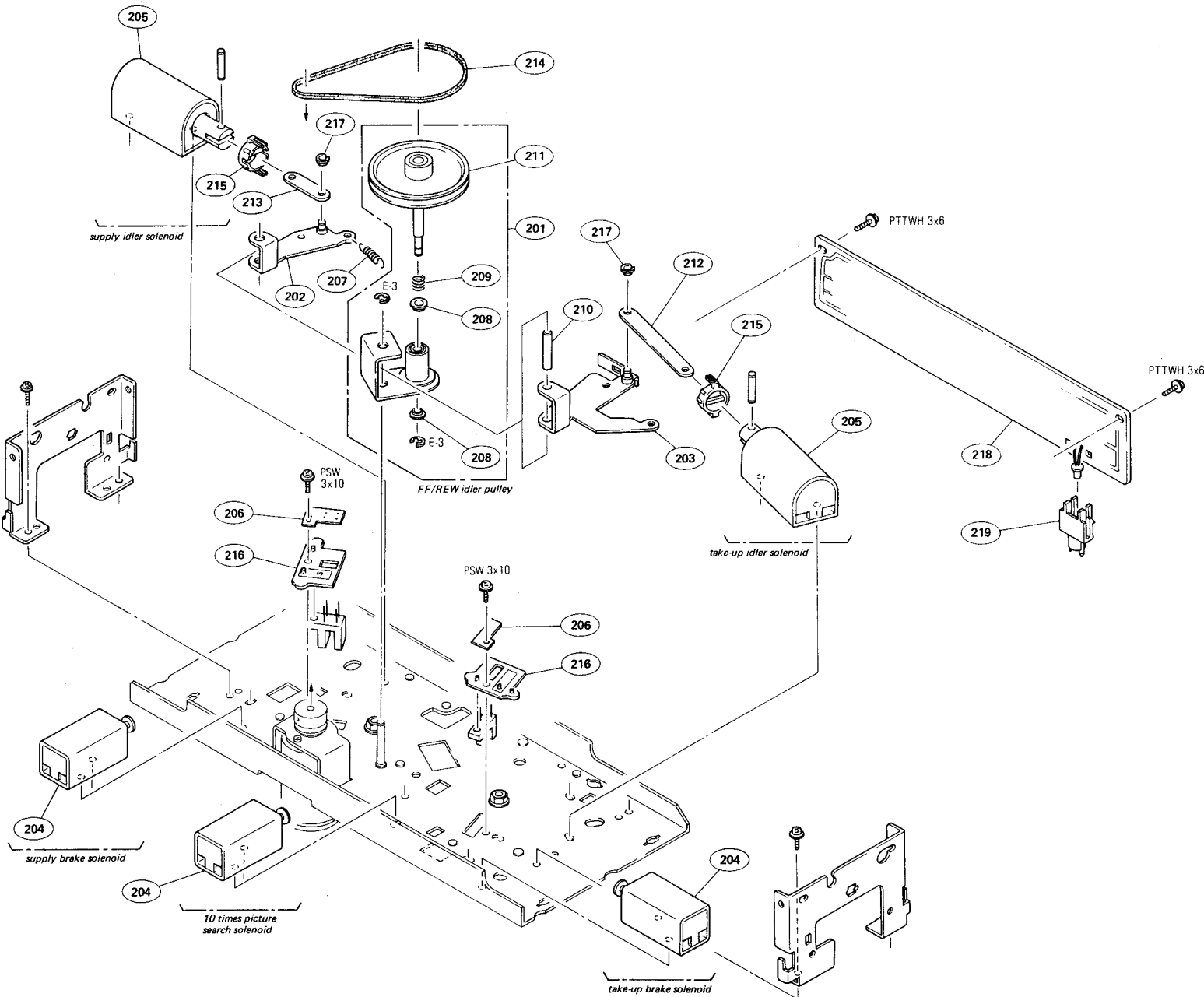
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- Item with no part number and/or no description are not stocked because they are seldom required for routine service.

No.	Parts No.	Description
101	A-6739-016-A	TABLE ASS'Y, REEL
102	A-6741-038-B	BRAKE ASS'Y, MAIN
103	X-3646-026-0	IDLER ASS'Y, FF
104	X-3668-705-0	BASE ASS'Y, R BRAKE
105	X-3668-726-0	LEVER ASS'Y, R CANCEL
106	X-3668-737-0	BRAKE ASS'Y, R
107	X-3668-738-0	ARM ASS'Y, T TENSION REGULATOR
108	X-3668-749-2	HOLDER ASS'Y
109	3-535-369-XX	SPRING, TENSION (12T)
110	1-603-589-00	PRINTED CIRCUIT BOARD, PH-4
111	1-603-590-00	PRINTED CIRCUIT BOARD, SW-46
112	1-806-232-11	DETECTOR TENSION
113	3-534-238-XX	SPRING, TENSION (23T)
114	3-548-124-00	SPRING, TENSION
115	3-549-861-00	SPRING, TENSION
116	3-630-615-XX	SPRING, TENSION (18T)
		(U ... S/N UP TO 16040)
		(C ... S/N UP TO 20610)
	3-669-980-00	SPRING, TENSION (20½T)
		(U ... S/N 16041 AND HIGHER)
		(C ... S/N 20611 AND HIGHER)
117	3-642-126-00	SPRING, COMPRESSION
118	3-642-427-00	SPRING, TENSION
119	3-668-031-00	RETAINER (UPPER), CASSETTE
120	3-668-766-00	SHAFT (T), REEL
121	3-668-780-00	CUSHION, IDLER
122	3-668-788-00	ARM, T DETECTION
123	3-668-798-00	STOPPER, T TENSION REGULATOR
124	3-668-819-00	LEVER (B), FR
125	3-668-820-00	LEVER (C), FR
126	3-668-822-00	PLATE, CANCEL, FR
127	3-668-823-00	ROD, PULL, FR
128	3-668-929-00	ACTUATOR, SR
129	3-668-931-00	HOLDER (UPPER), SR
130	3-668-932-00	HOLDER (LOWER), SR
131	3-668-966-00	SPRING
132	3-668-967-00	STOPPER, BRAKE
133	3-668-970-00	ARM, BRAKE
134	3-668-971-00	ARM, BRAKE RELEASE
135	3-669-924-00	SPRING
136	3-701-444-01	WASHER, 6MM DIA, 0.13T
137	3-701-444-11	WASHER, 6MM DIA, 0.25T
138	3-701-444-21	WASHER, 6MM DIA, 0.5T
139	3-701-506-01	SET SCREW, DOUBLE POINT 3x4
140	3-703-074-00	CAP 3, SHAFT
141	3-668-789-00	HOLDER, BRIDGE, PHOTO

REEL CHASSIS (3)

REEL CHASSIS (3)

Reel Chassis (bottom view)

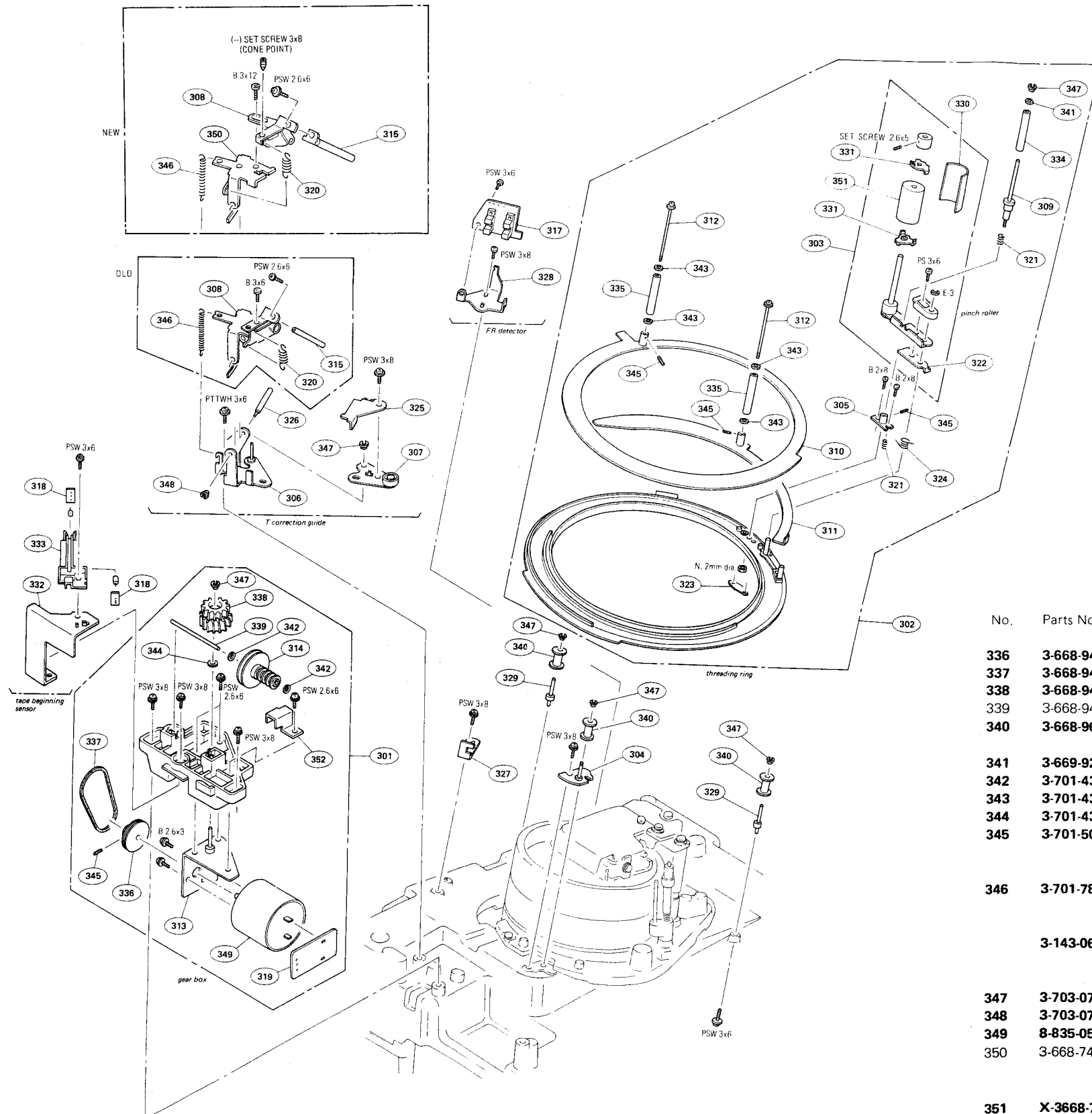


No.	Parts No.	Description
201	A-6740-069-A	PULLEY BLOCK ASS'Y, IDLER
202	X-3668-703-0	LEVER ASS'Y, S
203	X-3668-704-0	LEVER ASS'Y, T
204	1-454-284-00	SOLENOID
205	1-454-285-00	SOLENOID
206	1-603-434-00	PRINTED CIRCUIT BOARD, SW-43
207	3-437-452-00	SPRING, TENSION
208	3-650-512-00	COLLAR, (A)
209	3-651-572-00	SPRING, COMPRESSION
210	3-668-048-11	SPACER (DIA. 4x20)
211	3-668-772-00	SHAFT, IDLER PULLEY
212	3-668-781-00	JOINT, T
213	3-668-782-00	JOINT, S
214	3-668-785-00	BELT (67x2)
215	3-668-826-00	RETAINER, PIN, SOLENOID
216	3-668-828-00	BRACKET, PS
217	3-703-074-00	CAP 3, SHAFT
218	A-6717-212-A	MOUNTED CIRCUIT BOARD, "PD-16"
219	3-668-786-00	HOLDER, LED

- NOTE:
- The shaded and  -marked components are critical to safety. Replace only with same components as specified.
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THREADING THREADING

Tape Threading



NOTE:

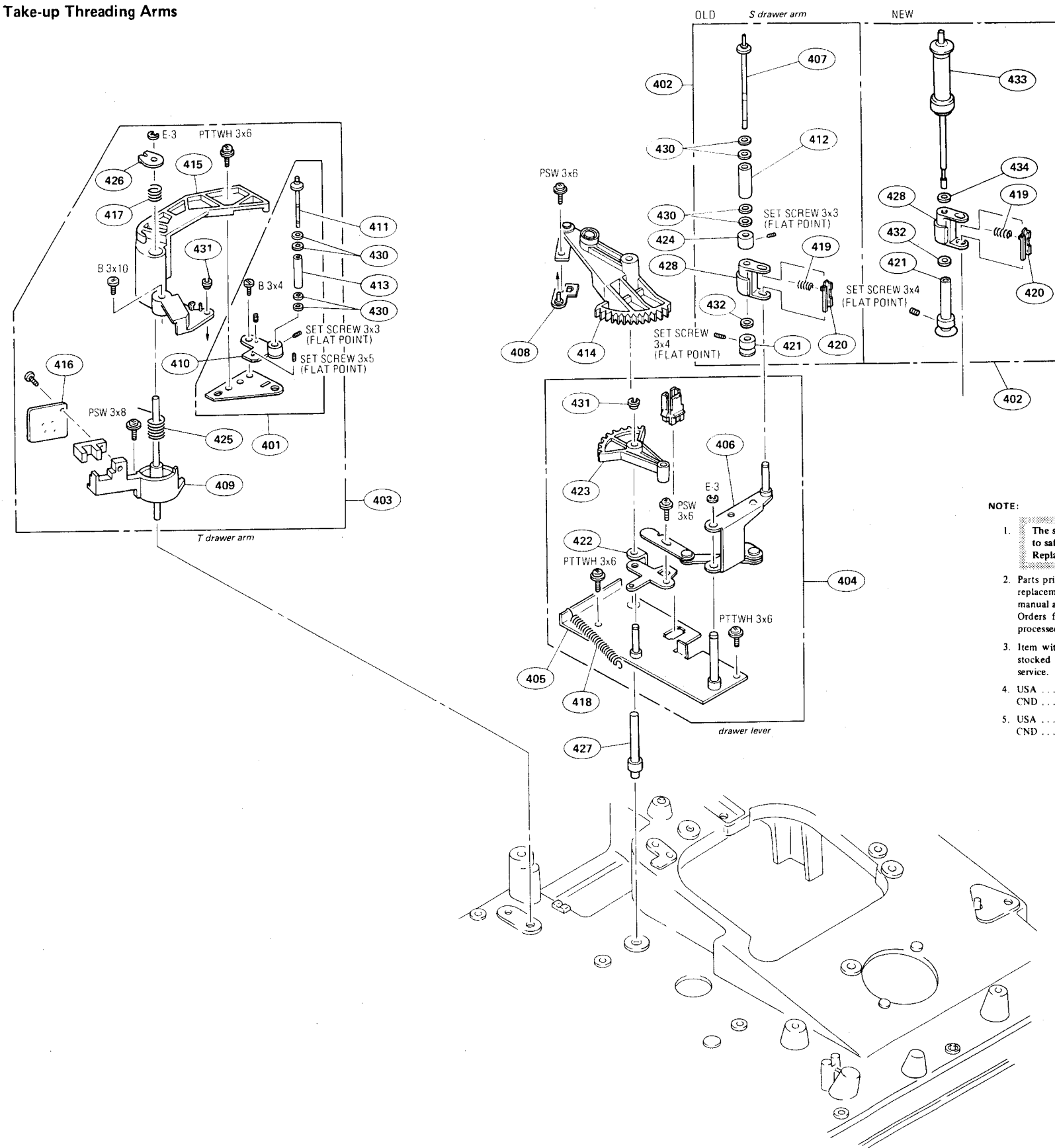
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3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

No.	Parts No.	Description
336	3-668-945-00	PULLEY, LM
337	3-668-946-00	BELT (38.5x1.8), SQUARE
338	3-668-947-00	PINION, L
339	3-668-948-00	SHAFT, WORM
340	3-668-963-00	ROLLER, RING
341	3-669-926-01	WASHER (3), THRUST
342	3-701-437-21	WASHER, 2MM DIA, 0.5T
343	3-701-438-11	WASHER, 2.5MM DIA, 0.25T
344	3-701-439-21	WASHER, 3MM DIA, 0.5T
345	3-701-505-00	SET SCREW, DOUBLE POINT 3x3
346	3-701-788-XX	SPRING, TENSION (35T) (U ... S/N UP TO 14740) (C ... S/N UP TO 20310)
	3-143-067-00	SPRING, TENSION (U ... S/N 14741 AND HIGHER) (C ... S/N 20311 AND HIGHER)
347	3-703-074-00	CAP 3, SHAFT
348	3-703-075-00	CAP 2, SHAFT
349	8-835-056-01	MOTOR, DC (DNR-1002A)
350	3-668-749-02	ARM (A), GUIDE, T CORRECTION (U ... S/N 14741 AND HIGHER) (C ... S/N 20311 AND HIGHER)
351	X-3668-758-3	PINCH ROLLER ASS'Y
352	3-669-960-00	RETAINER, SHAFT

No.	Parts No.	Description
301	A-6750-120-A	BOX BLOCK ASS'Y, GEAR
302	A-6750-124-D	RING BLOCK ASS'Y, MAIN
303	A-6750-125-D	PINCH ROLLER BLOCK ASS'Y
304	X-3668-719-0	ROLLER ASS'Y, RING
305	X-3668-720-0	BASE ASS'Y, ROLLER, PRECEDING
306	X-3668-721-0	CHASSIS ASS'Y, GUIDE
307	X-3668-722-0	LOCKER ASS'Y, FR
308	X-3668-723-0	ARM ASS'Y, GUIDE, T CORRECTION (U ... S/N UP TO 14740) (C ... S/N UP TO 20310)
	X-3668-723-2	ARM ASS'Y, GUIDE, T CORRECTION (U ... S/N 14741 AND HIGHER) (C ... S/N 20311 AND HIGHER)
309	X-3668-724-3	SHAFT ASS'Y, ROLLER, PRECEDING
310	X-3668-731-0	RING (UPPER) ASS'Y, SUB
311	X-3668-732-0	RING (LOWER) ASS'Y, SUB
312	X-3668-733-0	SHAFT ASS'Y, SR GUIDE
313	X-3668-742-0	BRACKET ASS'Y, MOTOR
314	X-3668-743-0	PULLEY ASS'Y, WORM
315	X-3668-756-0	SHAFT ASS'Y, T CORRECTION GUIDE (U ... S/N UP TO 14740) (C ... S/N UP TO 20310)
	X-3668-756-3	SHAFT ASS'Y, T CORRECTION GUIDE (U ... S/N 14741 AND HIGHER) (C ... S/N 20311 AND HIGHER)
317	1-603-585-00	PRINTED CIRCUIT BOARD, FR-11
318	1-603-737-00	PRINTED CIRCUIT BOARD, PH-5
319	1-603-767-00	PRINTED CIRCUIT BOARD, LM-7
320	3-472-327-00	SPRING, TENSION (U ... S/N UP TO 14740) (C ... S/N UP TO 20310)
	3-437-289-00	SPRING, TENSION (U ... S/N 14741 AND HIGHER) (C ... S/N 20311 AND HIGHER)
321	3-634-196-00	SPRING
322	3-642-558-00	ARM, PINCH ROLLER
323	3-668-743-00	NUT, PLATE, ROLLER, PRECEDING
324	3-668-745-00	SPRING
325	3-668-753-00	PLATE, ADJUSTMENT, FR LOCKER
326	3-668-754-00	SHAFT, GUIDE ARM, T CORRECTION
327	3-668-755-00	PLATE, STOPPER, SR
328	3-668-756-02	BRACKET, DETECTION, FR
329	3-668-757-00	SHAFT (A), RING ROLLER
330	3-668-888-00	COVER, PINCH
331	3-668-889-00	CAP, PINCH ROLLER
332	3-668-900-00	BRACKET, T SENSOR
333	3-668-901-00	HOLDER, T PHOTO
334	3-668-917-00	ROLLER, PRECEDING
335	3-668-919-00	ROLLER, SR GUIDE

THREADING ARM THREADING ARM

Supply and Take-up Threading Arms

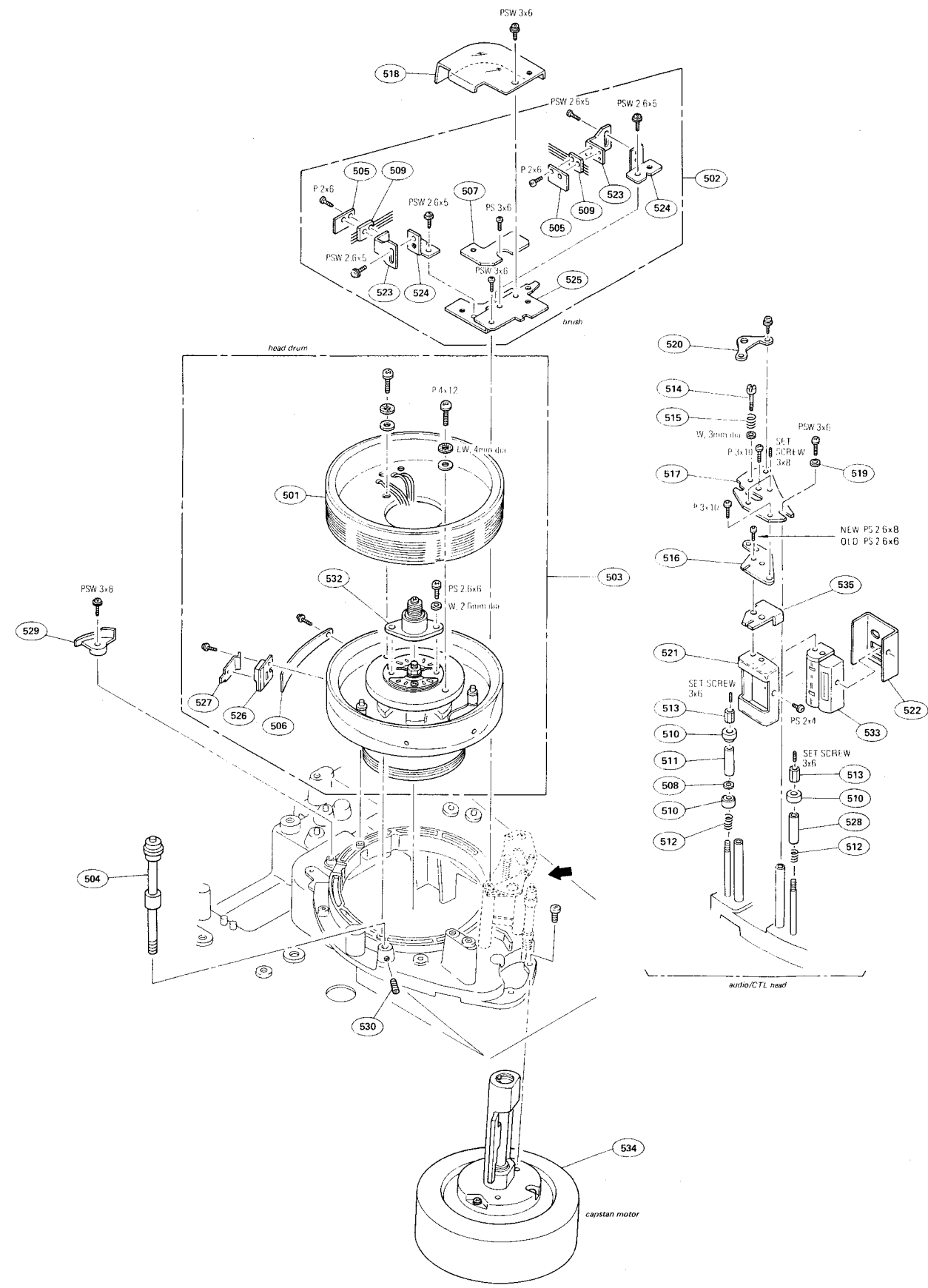


No.	Parts No.	Description
401	A-6746-020-A	ROLLER BLOCK ASS'Y, T GUIDE
402	A-6746-021-B	ROLLER BLOCK ASS'Y, S DRAWER (SERIAL NO. UP TO NOTE 4)
	A-6746-026-A	ROLLER BLOCK ASS'Y, S DRAWER (SERIAL NO. NOTE 5 AND HIGHER)
403	A-6750-121-A	ARM BLOCK ASS'Y, T DRAWER
404	A-6750-122-A	ARM BLOCK ASS'Y, S DRAWER
405	X-3668-710-0	BASE ASS'Y, ARM, S DRAWER
406	X-3668-711-0	ARM ASS'Y, S DRAWER
407	X-3668-712-0	SHAFT (2) ASS'Y, ROLLER (SERIAL NO. UP TO NOTE 4)
408	X-3668-713-0	LINK (B) ASS'Y, DRIVING
409	X-3668-714-0	RETAINER ASS'Y, ARM, T DRAWER
410	X-3668-715-0	PLATE ASS'Y, GUIDE, T
411	X-3668-716-0	SHAFT (3) ASS'Y, ROLLER
412	X-3668-718-0	GUIDE ASS'Y, TAPE (SERIAL NO. UP TO NOTE 4)
413	X-3668-727-0	GUIDE ASS'Y, TAPE
414	X-3668-729-0	LEVER ASS'Y, DRAWER
415	X-3668-741-0	ARM ASS'Y, T DRAWER
416	1-603-435-00	PRINTED CIRCUIT BOARD, SW-50
417	3-534-854-00	SPRING, COMPRESSION
418	3-540-506-00	SPRING, TENSION
419	3-644-718-00	SPRING, COMPRESSION
420	3-668-718-00	RETAINER, SPRING, S DRAWER
421	3-668-719-00	HOLDER (L), S GUIDE (SERIAL NO. UP TO NOTE 4)
	3-669-974-00	HOLDER (L), S GUIDE (SERIAL NO. NOTE 5 AND HIGHER)
422	3-668-720-00	LIMITER, S DRAWER
423	3-668-721-00	ARM, S DRIVING
424	3-668-724-00	FLANGE (2), LOWER (SERIAL NO. UP TO NOTE 4)
425	3-668-734-00	SPRING
426	3-668-735-00	RETAINER, SPRING
427	3-668-760-00	SHAFT, DRAWER LEVER
428	3-668-833-00	HOLDER (M), GUIDE
429	3-669-904-00	HOLDER, PT
430	3-701-438-01	WASHER, 2.5MM DIA, 0.13T
431	3-703-074-00	CAP 3, SHAFT
432	3-669-946-00	RING, O
433	A-6746-025-A	ROLLER BLOCK ASS'Y (1), S DRAWER (SERIAL NO. NOTE 5 AND HIGHER)
434	7-688-001-11	WASHER, 2MM DIA, MIDDLE (U ... S/N 16211 AND HIGHER) (C ... S/N 20611 AND HIGHER)

DRUM/CAPSTAN

DRUM/CAPSTAN

Drum Block and Capstan



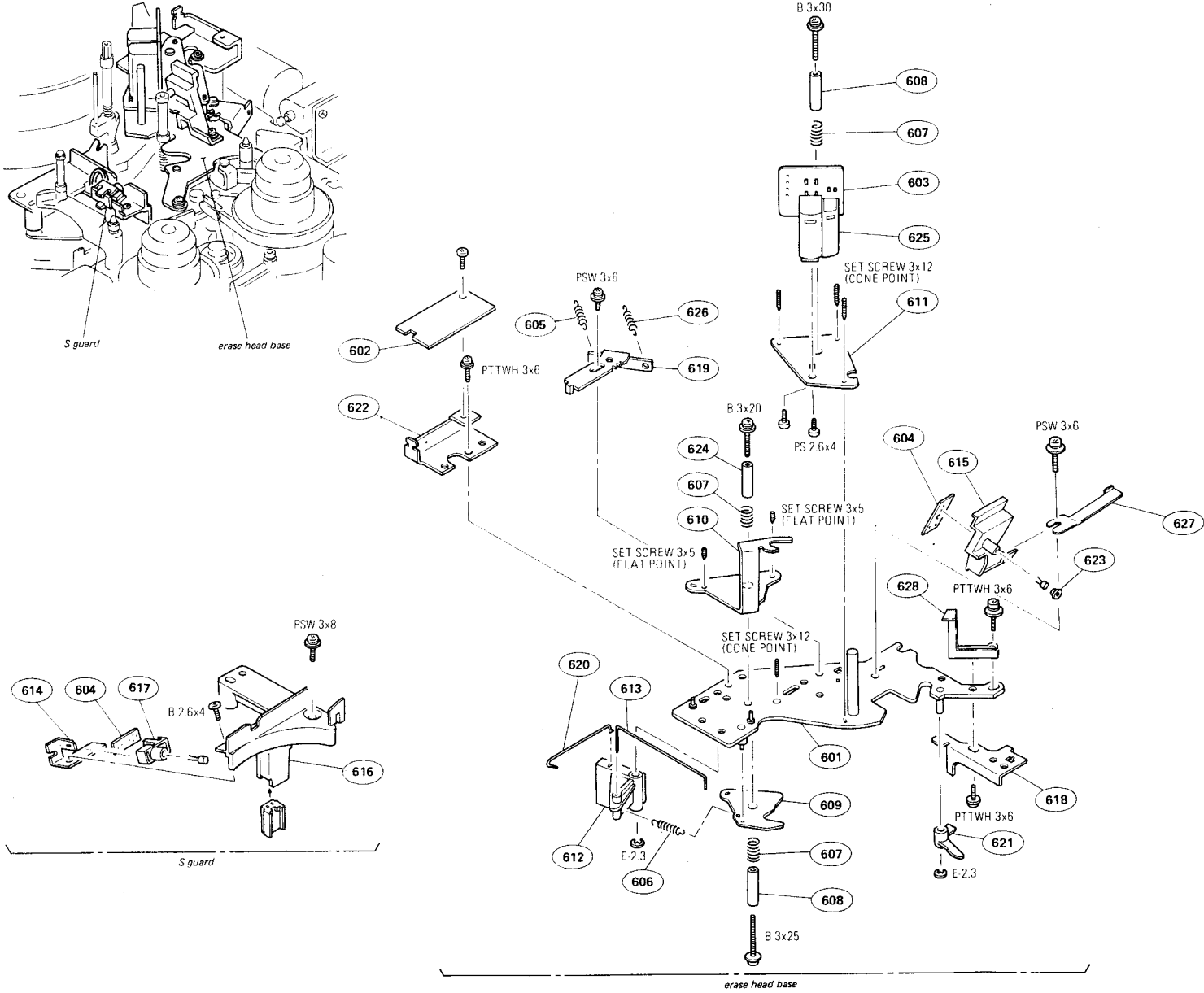
No.	Parts No.	Description
501	A-6709-102-A	DRUM ASS'Y, UPPER
502	A-6709-360-A	BRUSH (4) ASS'Y
503	A-6709-365-A	HEAD DRUM ASS'Y, DUH-18D-R
504	A-6709-382-A	GUIDE BLOCK ASS'Y, TAPE
505	1-582-150-00	BRUSH PRINTED CIRCUIT BOARD
506	1-586-633-00	CONDENSATION, SENSOR
507	1-604-063-00	PRINTED CIRCUIT BOARD, SP-14
508	3-534-329-00	WASHER, TAPE GUIDE
509	3-607-104-00	BRUSH
510	3-641-612-00	GUIDE, TAPE
511	3-641-613-00	GUIDE, TAPE
512	3-641-615-00	SPRING, COMPRESSION
513	3-641-616-00	NUT, TAPE GUIDE ADJUSTMENT
514	3-641-621-00	SCREW, HEAD ADJUSTING
515	3-641-622-00	SPRING, COMPRESSION
516	3-641-640-00	BRACKET, (1) C.T.L. HEAD
517	3-641-641-02	BRACKET C.T.L. HEAD, (2)
518	3-641-647-02	GUARD, BRUSH
519	3-645-076-00	WASHER, M-REEL S
520	3-647-815-00	PLATE, ADJUSTMENT, CTL HEAD
521	3-650-301-02	COVER, HEAD, D-CTL
522	3-650-302-00	COVER, HEAD, (REAR)
523	3-655-613-00	BRACKET (1), BRUSH
524	3-655-614-00	BRACKET (2), BRUSH
525	3-655-615-00	DECK, BRUSH
526	3-656-501-00	HOLDER, TERMINAL
527	3-656-502-00	PLATE, TERMINAL
528	3-660-102-00	GUIDE, TAPE
529	3-668-999-00	CAM, PROTECTION
530	3-701-508-00	SET SCREW, DOUBLE POINT 3x6
531	4-555-017-00	SCREW
532	8-825-680-00	RING ASS'Y, SLIP
533	8-829-358-31	HEAD, CTL (EPP150-5803B)
534	8-838-019-01	MOTOR, DC (BHF-1600A)
535	3-669-985-00	PLATE, ADJUSTMENT (U ... S/N 18011 AND HIGHER) (C ... S/N 20661 AND HIGHER)

NOTE:

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ERASE HEAD BASE

Erase Head Base and S Guard



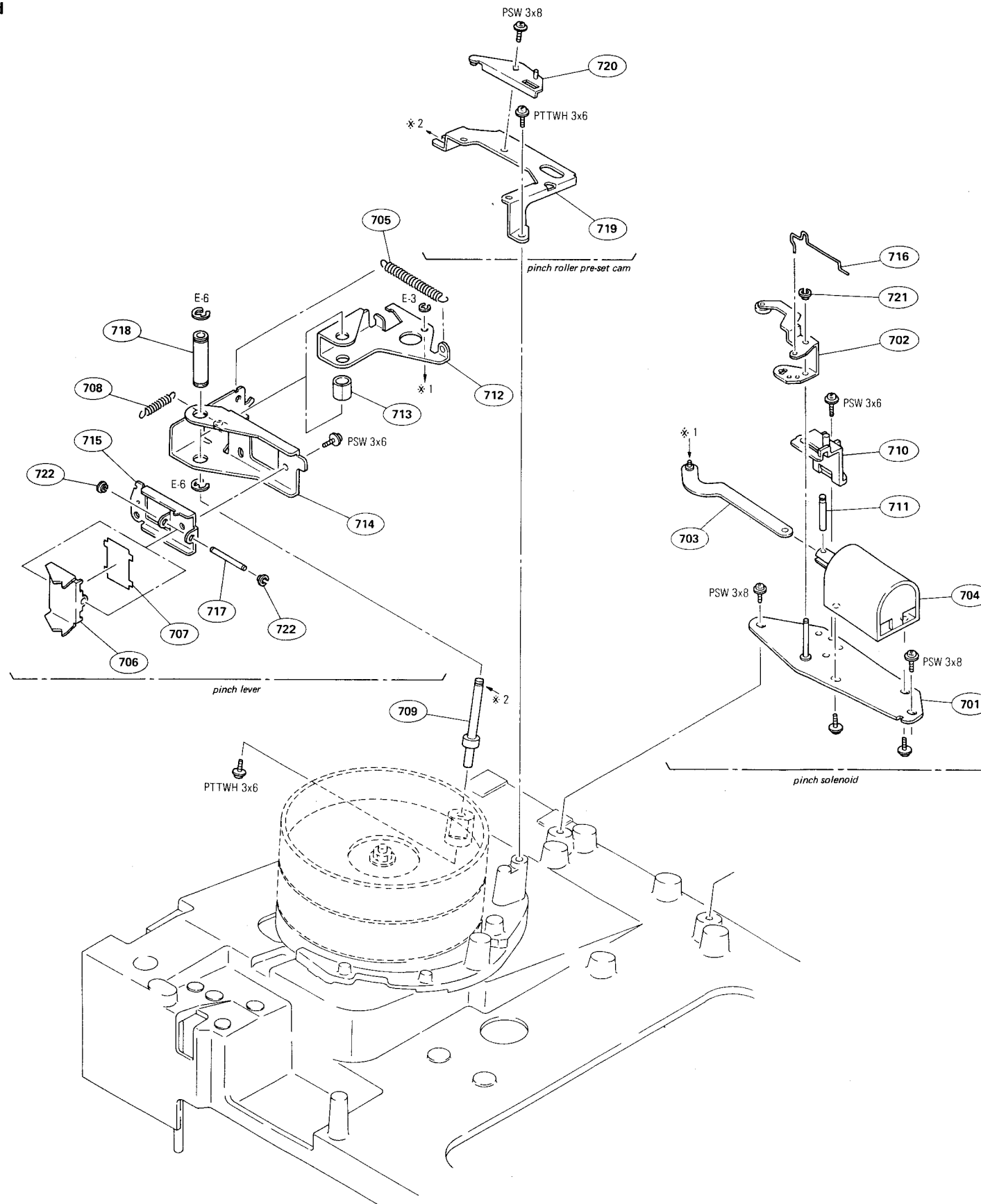
No.	Parts No.	Description
601	X-3668-728-0	DECK ASS'Y, E HEAD
602	1-586-192-00	PRINTED CIRCUIT BOARD, AH-3
603	1-603-729-00	PRINTED CIRCUIT BOARD, EC-19
604	1-603-737-00	PRINTED CIRCUIT BOARD, PH-5
605	3-534-238-XX	SPRING, TENSION (23T) (U ... S/N UP TO 15540) (C ... S/N UP TO 20410)
	3-535-558-00	SPRING, TENSION (U ... S/N 15541 ~ 16210) (C ... S/N 20411 ~ 20610)
	3-538-102-00	SPRING, TENSION (U ... S/N 16211 AND HIGHER) (C ... S/N 20611 AND HIGHER)
606	3-630-615-XX	SPRING, TENSION (18T)
607	3-637-335-00	SPRING, COMPRESSION
608	3-657-086-00	SPACER (3-20)
609	3-668-705-00	HOLDER (LOWER), S
610	3-668-706-00	HOLDER (UPPER), S
611	3-668-707-00	TABLE, HEAD, E
612	3-668-708-00	ARM, DRIVING, CORRECTION GUIDE
613	3-668-709-00	ROD, PULL, CORRECTION GUIDE
614	3-668-809-02	BRACKET, HOLDER
615	3-668-832-02	HOLDER (S)
616	3-668-836-02	GUARD, S
617	3-668-837-00	HOLDER, LED
618	3-668-859-00	STOPPER, RING
619	3-668-860-00	HOOK, SPRING, TENSION REGULATOR
620	3-668-884-03	JOINT, RESERVE PRESS
621	3-668-894-00	LEVER, RELEASE
622	3-668-962-00	BRACKET, AH PC BOARD
623	3-669-920-00	COVER, S PHOTO
624	4-855-006-11	SPACER, PIPE
625	8-825-513-20	HEAD, CTL ERASE (EPP170-58)
626	3-669-979-00	SPRING, TENSION
627	3-669-964-00	PLATE, GROUND (U ... S/N 13891 AND HIGHER) (C ... S/N 20261 AND HIGHER)
628	3-669-963-00	SPRING, LEAF, GROUND (U ... S/N 12791 AND HIGHER) (C ... S/N 20211 AND HIGHER)

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PINCH LEVER PINCH LEVER

Pinch Lever and Pinch Solenoid



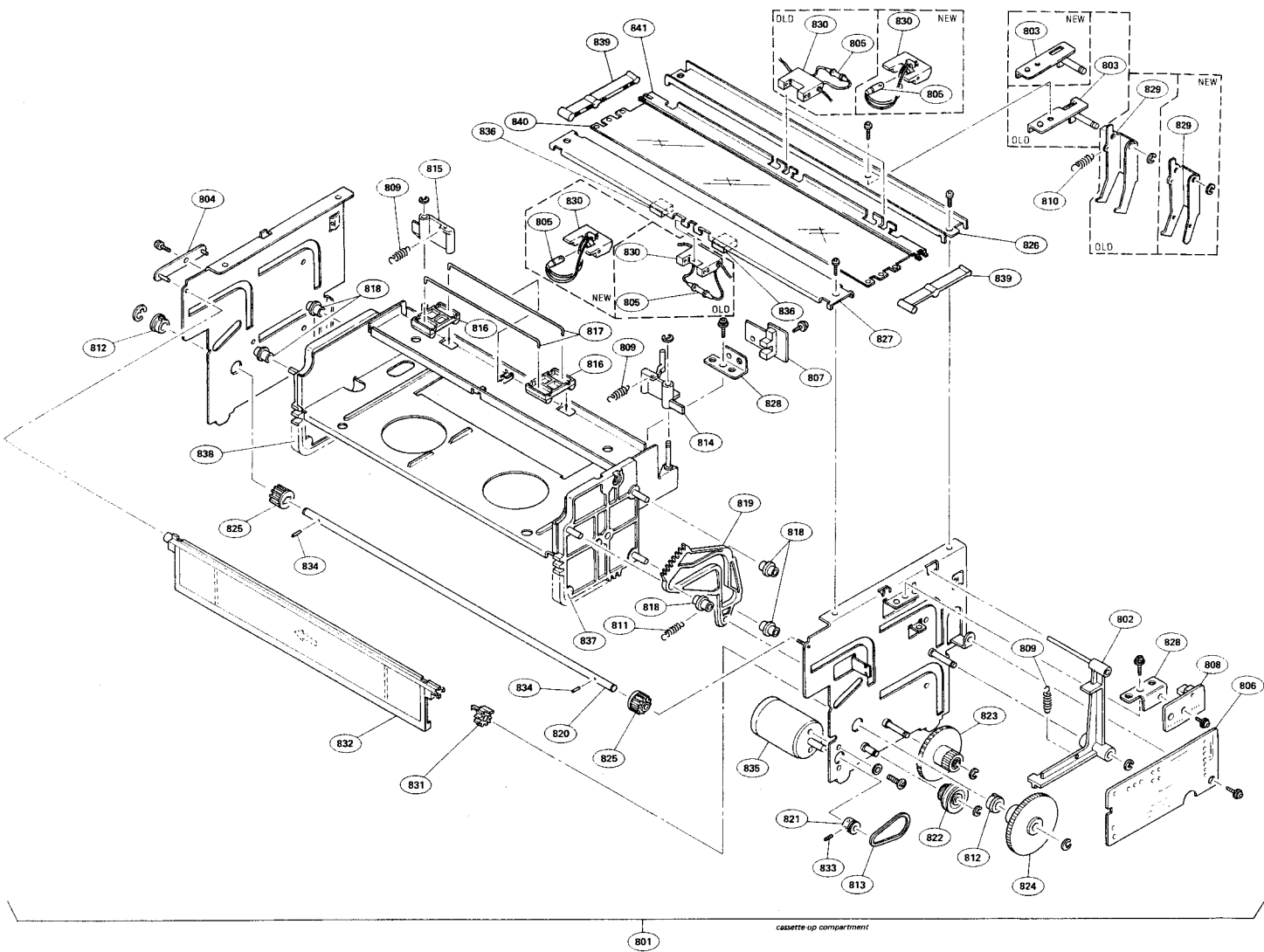
No.	Parts No.	Description
701	X-3668-734-0	BASE ASS'Y, PINCH PRESS
702	X-3668-735-3	LEVER ASS'Y, RESERVE PRESS
703	X-3668-736-0	JOINT ASS'Y
704	1-454-286-00	SOLENOID
705	3-610-265-02	SPRING
706	3-642-518-00	LEVER, PINCH
707	3-642-519-00	SPRING
708	3-645-392-00	SPRING, TENSION
709	3-668-862-00	SHAFT, PRESS LEVER, PINCH
710	3-668-863-00	GUIDE, ARBOR
711	3-668-864-00	PIN, SOLENOID
712	3-668-865-00	LEVER (B), PINCH PRESS
713	3-668-867-00	SPACER (8x9)
714	3-668-868-00	LEVER (A), PINCH PRESS
715	3-668-883-00	PLATE, ADJUSTMENT, PINCH PRESS
716	3-668-884-00	JOINT, RESERVE PRESS
717	3-668-895-00	SHAFT
718	3-668-896-00	SLEEVE, PRESS LEVER, PINCH
719	3-668-997-00	DECK, P SUB PRESS
720	3-668-998-00	CAM, SUB PRESS
721	3-703-074-00	CAP 3, SHAFT
722	3-703-075-00	CAP 2, SHAFT

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CASSETTE-UP COMPARTMENT CASSETTE-UP COMPARTMENT

Cassett -up Compartment



NOTE:

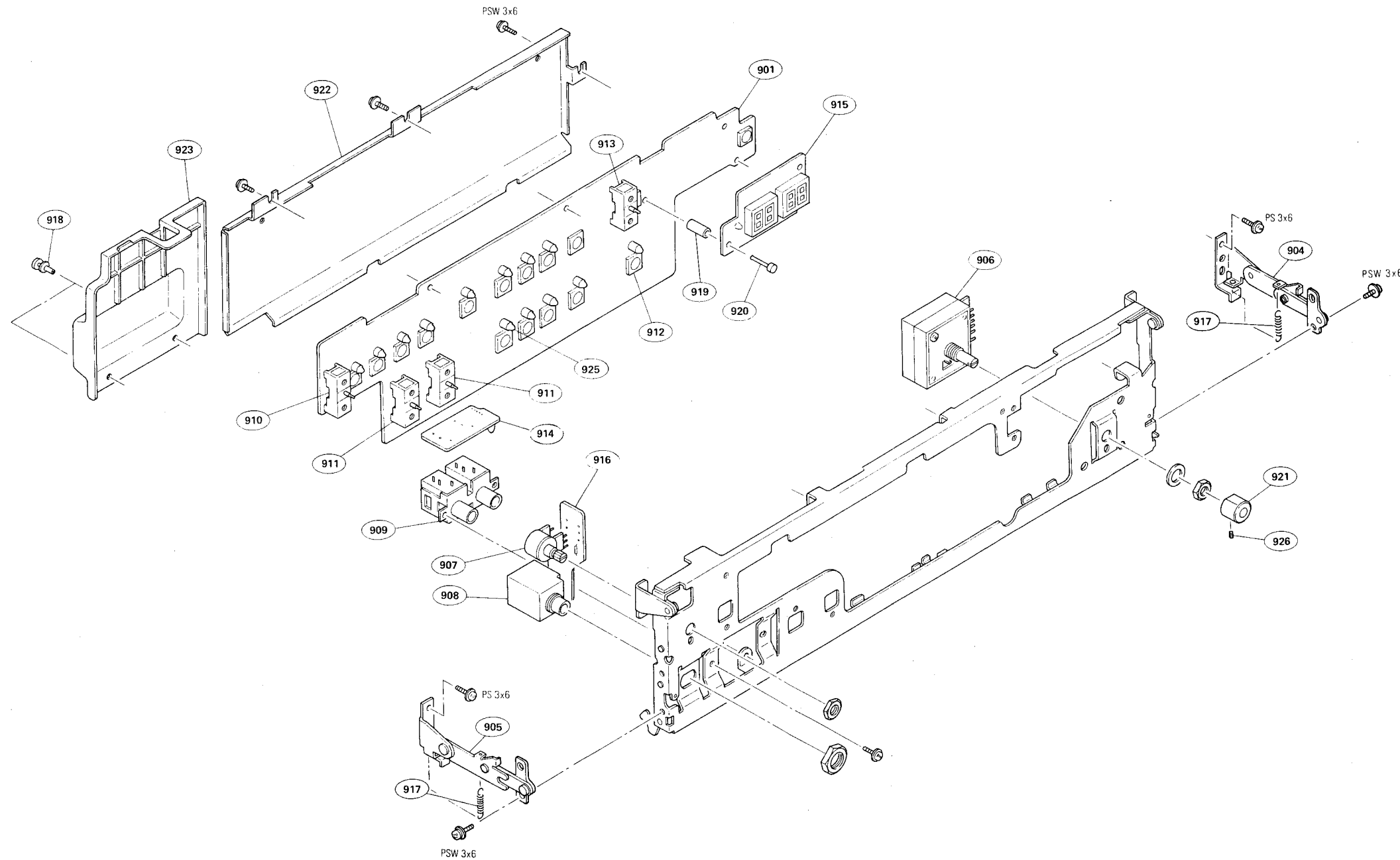
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No.	Parts No.	Description
831	3-668-315-02	GEAR, LID
832	3-668-371-00	LID, CASSETTE
833	3-701-506-01	SET SCREW, DOUBLE POINT 3x4
834	3-703-358-00	PIN, PARALLEL (DIA. 2x8)
835	8-835-055-01	MOTOR, DC (DNR-4700A)
836	3-672-926-00	CUSHION, LID (U ... S/N 13891 AND HIGHER) (C ... S/N 20261 AND HIGHER)
837	X-3668-057-0	CASECON ASS'Y, RACK (RIGHT)
838	X-3668-058-0	CASECON ASS'Y, RACK (LEFT)
839	3-668-313-02	FRAME, SUPPORT, REFLECTOR
840	3-672-604-11	REFLECTOR
841	3-672-639-03	BRACKET, LAMP

No.	Parts No.	Description
801	A-6751-104-C	CASSETTE-UP ASS'Y
802	X-3668-059-0	ARM ASS'Y, SWITCH, DOWN
803	X-3668-060-0	HOLDER ASS'Y, ARM (U ... S/N UP TO 14740) (C ... S/N UP TO 20310)
	X-3668-060-3	HOLDER ASS'Y, ARM (U ... S/N 14741 AND HIGHER) (C ... S/N 20311 AND HIGHER)
804	X-3668-061-0	SUPPORT ASS'Y, LID
805	1-518-455-00	LAMP, PILOT (U ... S/N UP TO 14740) (C ... S/N UP TO 20310)
	1-518-508-00	LAMP, PILOT (U ... S/N 14741 AND HIGHER) (C ... S/N 20311 AND HIGHER)
806	1-604-429-00	PRINTED CIRCUIT BOARD, CC-9
807	1-604-430-00	PRINTED CIRCUIT BOARD, CC-10
808	1-604-431-00	PRINTED CIRCUIT BOARD, CC-11
809	3-507-051-00	SPRING, TENSION
810	3-534-217-00	SPRING, TENSION
811	3-536-780-00	SPRING, TENSION
812	3-668-474-00	BEARING (6)
813	3-653-387-00	BELT, LM
814	3-668-295-00	LEVER (RIGHT), CASSETTE PUSH-OUT
815	3-668-296-00	LEVER (LEFT), CASSETTE PUSH-OUT
816	3-668-297-00	RETAINER, CASSETTE
817	3-668-298-00	SPRING
818	3-668-299-00	ROLLER, GUIDE
819	3-668-300-00	CAM, LID OPEN
820	3-668-301-00	SHAFT, DRIVING
821	3-668-302-00	PULLEY, MOTOR
822	3-668-303-00	GEAR (A)
823	3-668-304-00	GEAR (B)
824	3-668-305-00	GEAR (C)
825	3-668-306-00	GEAR (D)
826	3-668-307-00	JOINT (R), LEFT & RIGHT
827	3-668-308-03	JOINT (F), LEFT & RIGHT
828	3-668-309-00	BRACKET, SWITCH
829	3-668-310-00	ARM, LID OPEN (U ... S/N UP TO 14740) (C ... S/N UP TO 20310)
	3-668-310-02	ARM, LID OPEN (U ... S/N 14741 AND HIGHER) (C ... S/N 20311 AND HIGHER)
830	3-668-314-00	HOLDER, LAMP (U ... S/N UP TO 14740) (C ... S/N UP TO 20310)
	3-668-314-02	HOLDER, LAMP (U ... S/N 14741 AND HIGHER) (C ... S/N 20311 AND HIGHER)

FUNCTION CONTROL FUNCTION CONTROL

Function Control



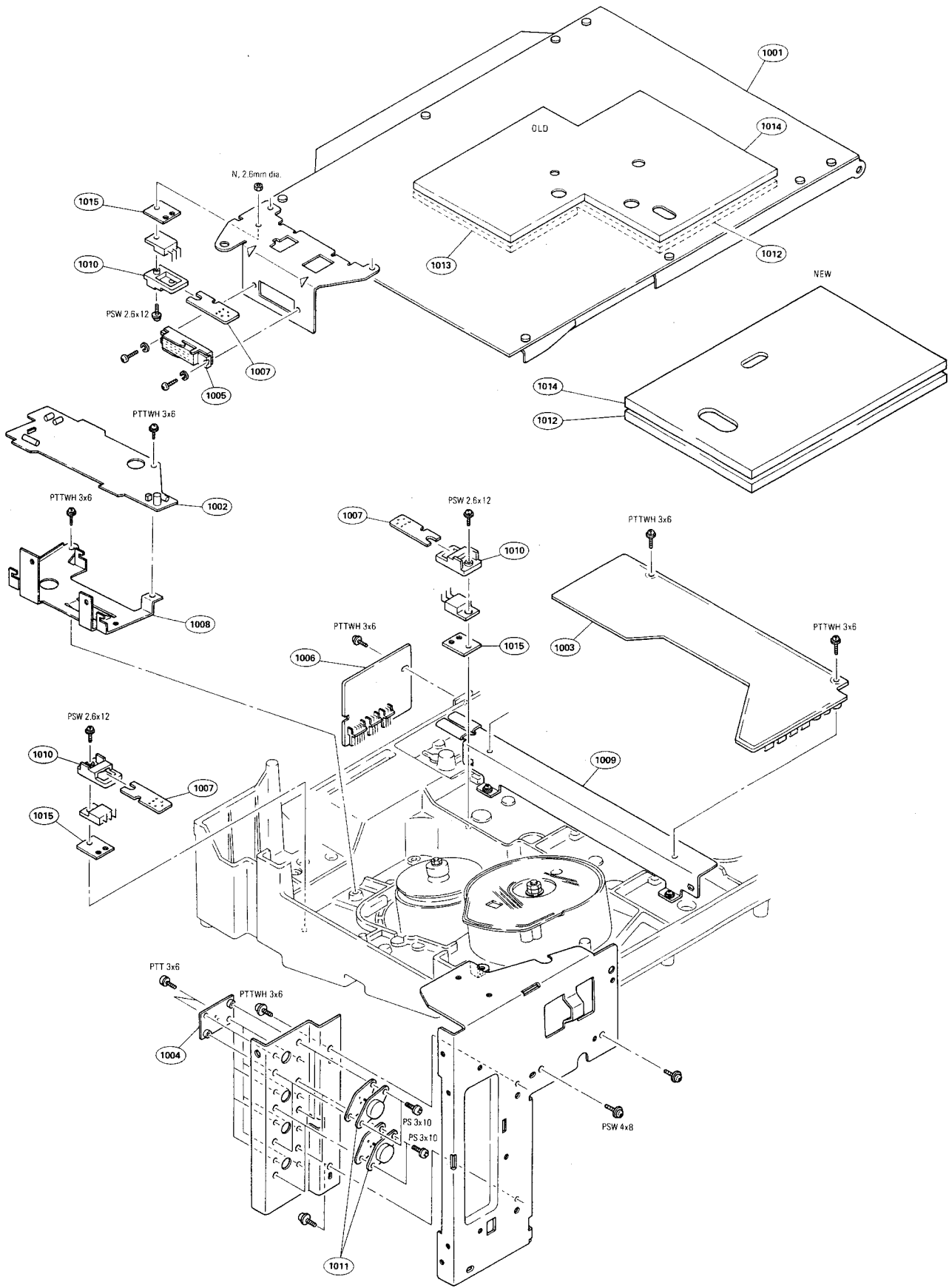
No.	Parts No.	Description
901	A-6728-290-A	MOUNTED CIRCUIT BOARD, KY-13
904	X-3668-766-0	STAY (RIGHT) ASS'Y, LOCK
905	X-3668-765-0	STAY (LEFT) ASS'Y, LOCK
906	1-226-996-21	ENCODER, ROTARY
907	1-228-218-00	R, VAR, CARBON 500/500
908	1-507-553-00	JACK
909	1-507-733-00	JACK
910	1-516-963-00	SWITCH, LEVER SLIDE
911	1-516-995-00	SWITCH, LEVER SLIDE
912	1-552-539-00	SWITCH, KEY BOARD
913	1-553-003-00	SWITCH, LEVER SLIDE
914	1-603-732-00	PRINTED CIRCUIT BOARD, MI-3
915	1-603-733-00	PRINTED CIRCUIT BOARD, DP-10
916	1-603-734-00	PRINTED CIRCUIT BOARD, HP-3
917	3-437-288-00	SPRING, TENSION
918	3-531-576-11	RIVET
919	3-659-487-00	HOLDER, BUZZER
920	3-659-488-00	PIN, BUZZER HOLDER
921	3-668-930-00	BOSS, FITTING, KNOB
922	3-668-933-00	PLATE, BOTTOM, KEYBOARD
923	3-668-934-00	COVER, MICROPHONE JACK
925	3-669-905-00	HOLDER, LAMP
926	3-701-505-00	SET SCREW, DOUBLE POINT 3x3

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CHASSIS (1) CHASSIS (1)

Chassis (bottom view)

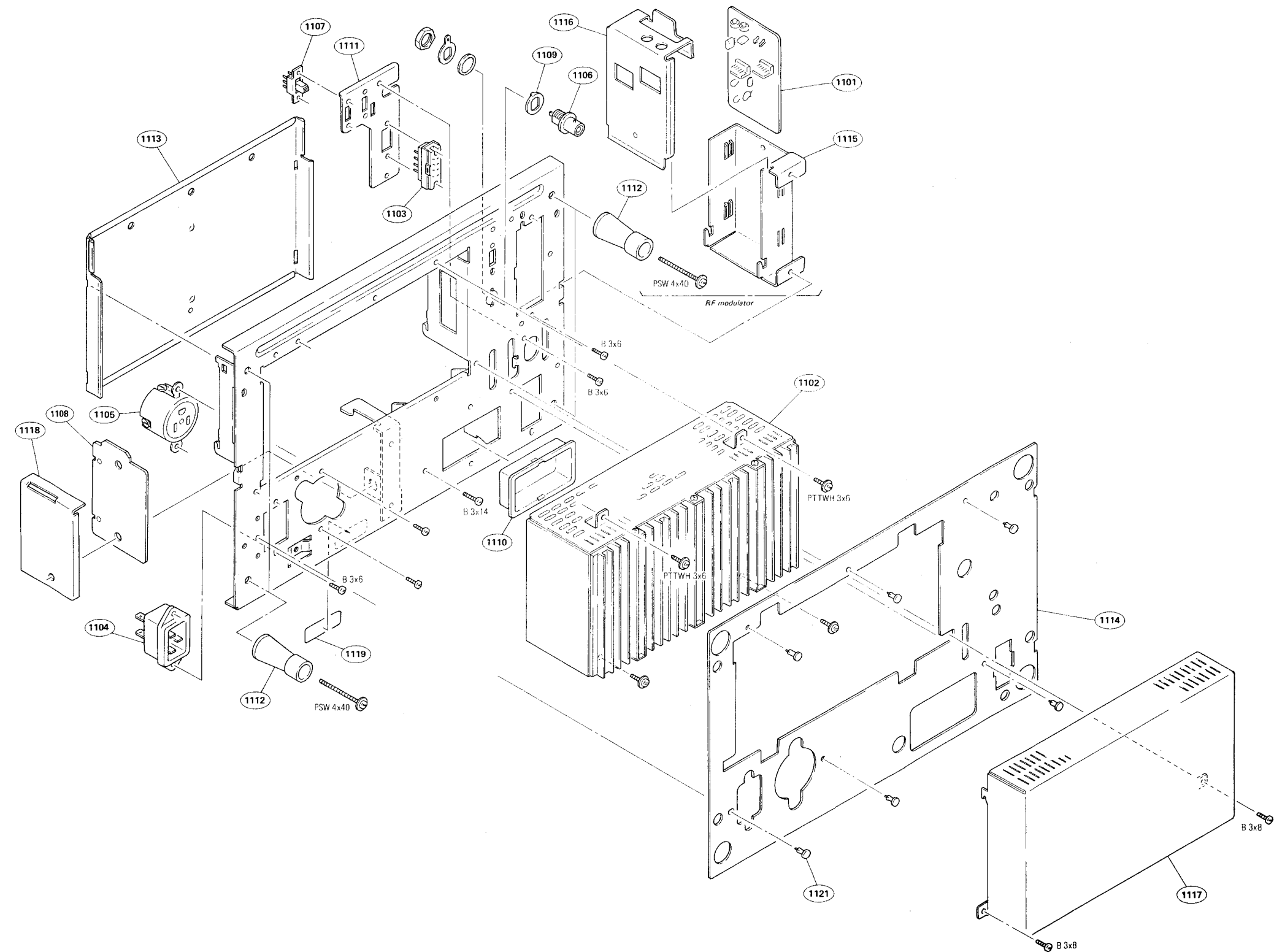


No.	Parts No.	Description
⚠ 1001	A-6717-211-A	MOUNTED CIRCUIT BOARD, SY-68 (U ... S/N UP TO 15040) (C ... S/N UP TO 20410)
	A-6717-211-B	MOUNTED CIRCUIT BOARD, SY-68 (U ... S/N 15041~17510) (C ... S/N 20411~20660)
	A-6717-211-C	MOUNTED CIRCUIT BOARD, SY-68 (U ... S/N 17511 AND HIGHER) (C ... S/N 20661 AND HIGHER)
⚠ 1002	A-6723-161-A	MOUNTED CIRCUIT BOARD, DC-10
⚠ 1003	A-6725-358-A	MOUNTED CIRCUIT BOARD, MR-11
1004	1-526-559-00	SOCKET
1005	1-561-583-00	RECEPTACLE (FEMALE) 33P
1006	1-603-588-00	PRINTED CIRCUIT BOARD, ML-1
1007	1-605-018-00	PRINTED CIRCUIT BOARD, PT-9
1008	3-668-898-00	BRACKET, DC-10 PC BOARD
1009	3-668-978-00	RETAINER, HARNESS
1010	3-669-904-00	HOLDER, PT
1011	3-701-422-00	SPACER, MICA
1012	3-669-930-00	SHIELD (1) (M), SY (U ... S/N UP TO 10440) (C ... S/N UP TO 20110)
	3-669-959-00	SHIELD (1) (M), SY (U ... S/N 10441 AND HIGHER) (C ... S/N 20111 AND HIGHER)
1013	3-669-931-00	SHIELD (2) (M), SY (U ... S/N UP TO 10440) (C ... S/N UP TO 20110)
1014	3-669-933-00	SHIELD (P), SY (U ... S/N UP TO 10440) (C ... S/N UP TO 20110)
	3-669-957-00	SHIELD (P), SY (U ... S/N 10441 AND HIGHER) (C ... S/N 20111 AND HIGHER)
1015	3-703-207-11	INSULATOR, TO-220

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CHASSIS (2) CHASSIS (2)

Chassis (rear view)



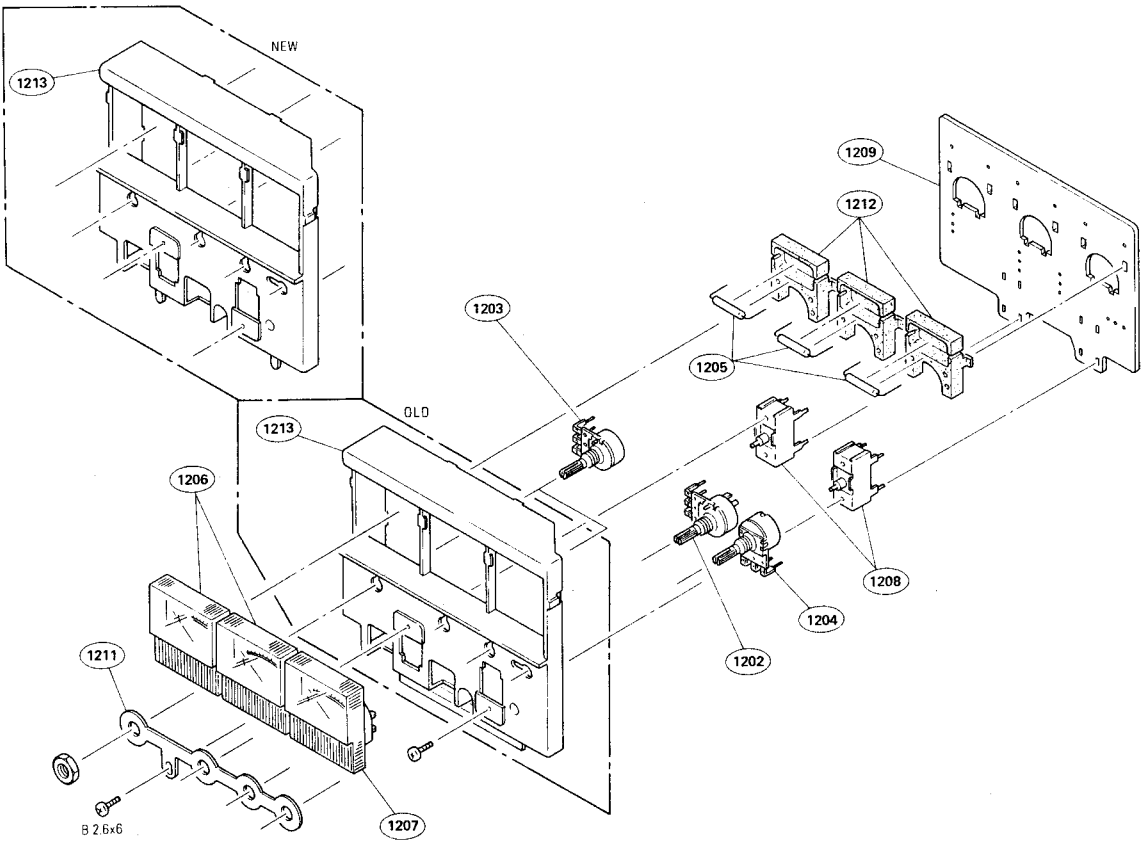
No.	Parts No.	Description
▲ 1101	A-6711-276-A	MOUNTED CIRCUIT BOARD, RE-5
▲ 1102	1-413-069-00	SWITCHING REGULATOR (UR-01)
1103	1-509-095-00	RECEPTACLE, 8P FEMALE "TV"
▲ 1104	1-509-546-00	3P INLET
▲ 1105	1-509-841-00	OUTLET, AC
1106	1-509-891-00	RECEPTACLE, BNC
1107	1-516-779-XX	SLIDE SWITCH
1108	1-603-727-00	PRINTED CIRCUIT BOARD, AC-26
1109	3-654-545-00	SPACER, BNC
1110	3-668-814-00	ESCUTCHEON, CONNECTOR
1111	3-668-842-00	PLATE, CONNECTOR, SUB
1112	3-668-924-00	FOOT, REAR
1113	3-668-926-00	SHIELD, SW-REG
1114	3-668-958-00	PLATE (EU), ORNAMENTAL
1115	3-668-960-00	BRACKET, RE
1116	3-668-961-00	PLATE, SHIELD, RE
1117	3-668-989-00	COVER, SWITCH REGULATOR
1118	3-669-941-00	PROTECTOR (U), AC
1119	3-703-044-26	LABEL, CAUTION
1121	4-812-134-00	RIVET, NYLON, 3.5

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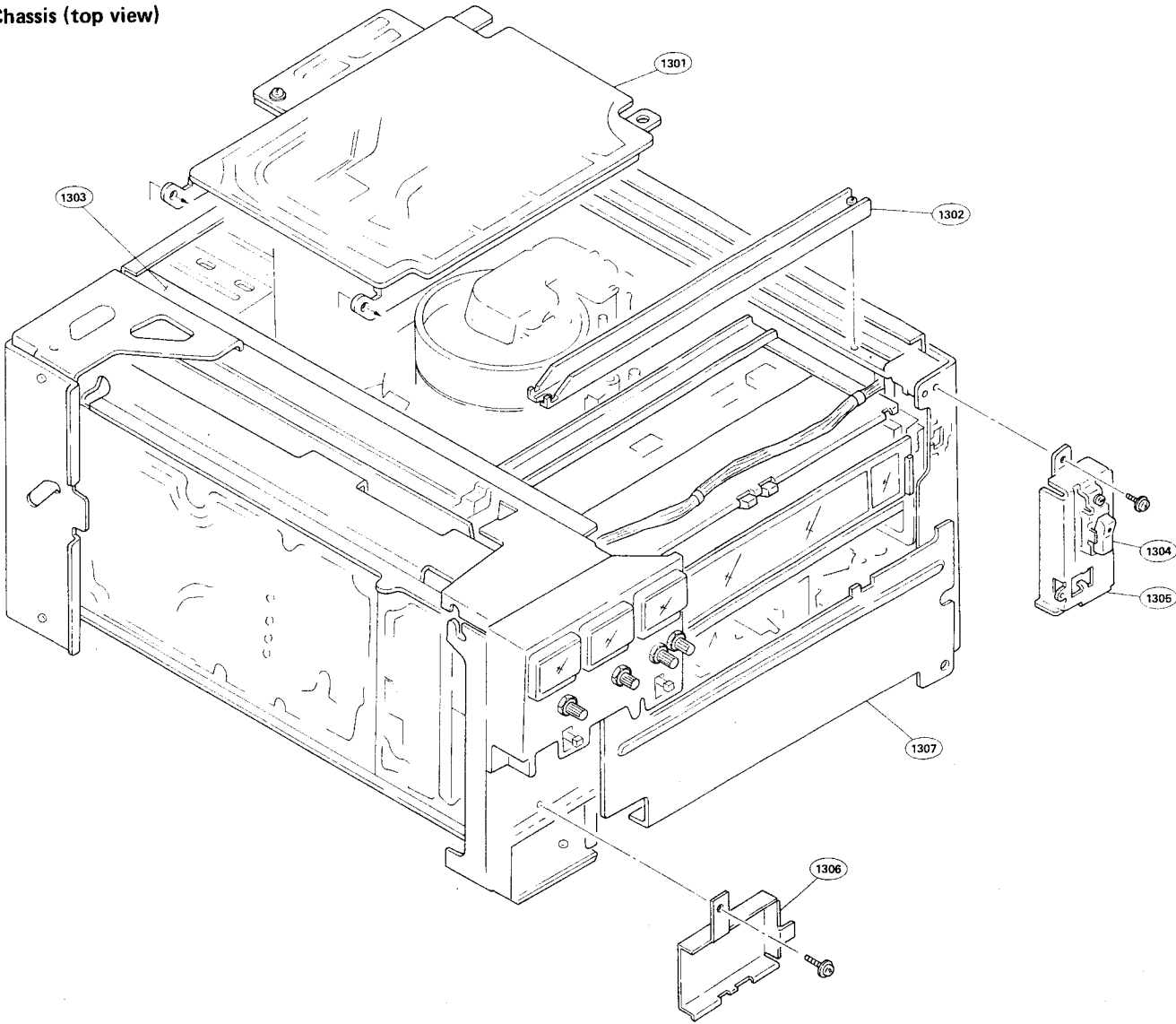
METER PANEL

CHASSIS (3)

Meter Panel



Chassis (top view)



No.	Parts No.	Description
1202	1-224-525-00	R, VAR, CARBON 10K
1203	1-226-395-00	R, VAR, CARBON 20K
1204	1-226-983-00	R, VAR, CARBON 100K
1205	1-518-462-00	LAMP, PILOT
1206	1-520-393-00	METER, AUDIO
1207	1-520-440-00	METER, VIDEO
1208	1-553-003-00	SWITCH, LEVER SLIDE
1209	1-604-970-00	PRINTED CIRCUIT BOARD, MC-17
1211	3-668-824-00	PLATE (E), GROUND
1212	3-668-825-00	HOLDER, LAMP
1213	3-668-840-00	PANEL (E), METER (U ... S/N UP TO 13890) (C ... S/N UP TO 20260)
	3-668-840-03	PANEL (E), METER (U ... S/N 13891 AND HIGHER) (C ... S/N 20261 AND HIGHER)

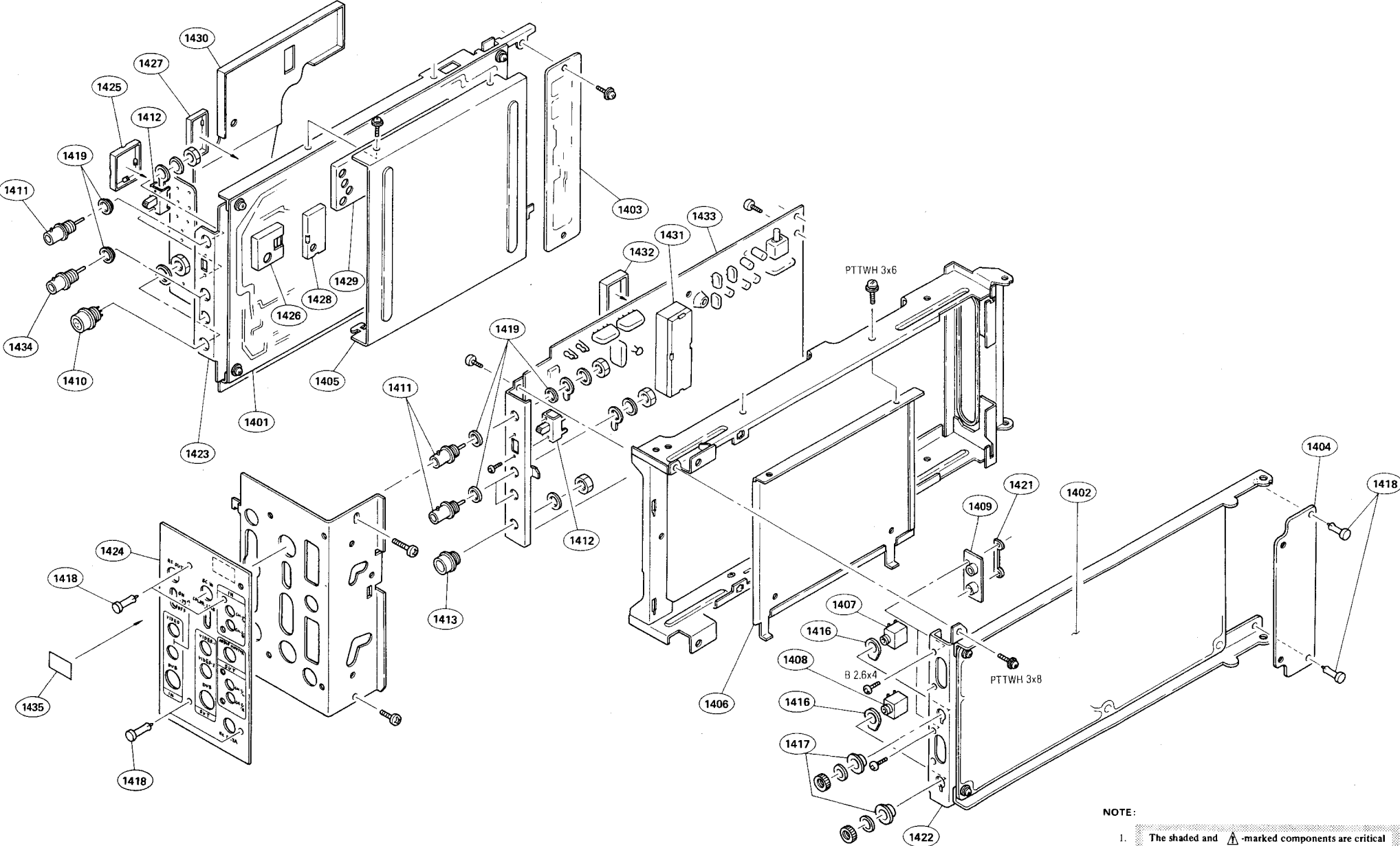
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No.	Parts No.	Description
1301	A-6715-119-A	MOUNTED CIRCUIT BOARD, SV-31
1302	A-6730-439-A	BRACKET ASS'Y
1303	X-3668-739-3	BEAM ASS'Y, LEFT
1304	1-553-515-00	SWITCH, ROCKER
1305	3-668-811-00	BRACKET, SWITCH, POWER
1306	3-668-965-00	PLATE, SHIELD
1307	3-668-977-00	FRAME, FRONT

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PRINTED CIRCUIT BOARD PRINTED CIRCUIT BOARD

Printed Circuit Boards



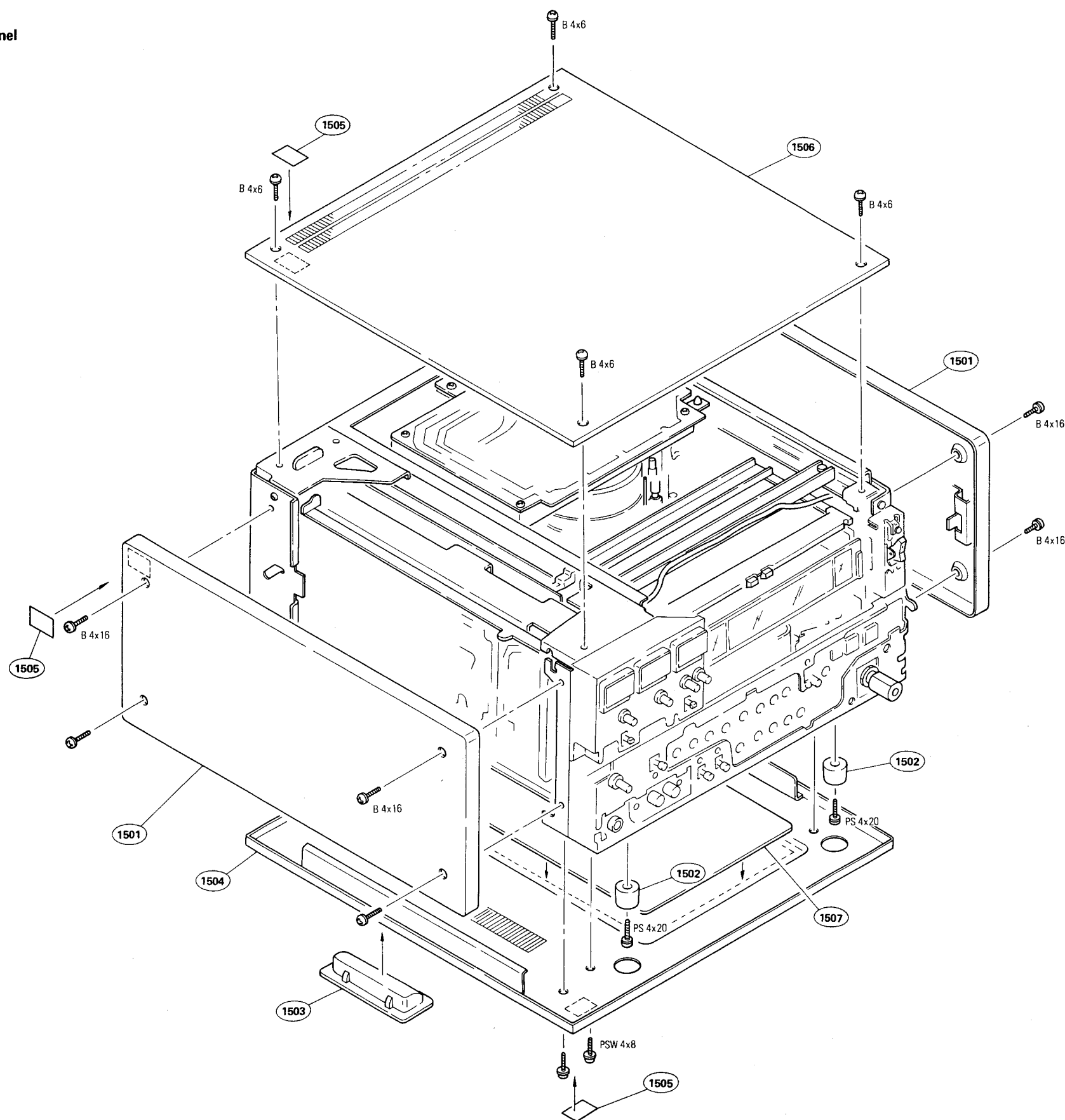
VO-5850
VO-5850J

No.	Parts No.	Description
1401	A-6711-274-A	MOUNTED CIRCUIT BOARD, MP-12
1402	A-6713-109-A	MOUNTED CIRCUIT BOARD, AU-21 (SERIAL NO. UP TO NOTE 4)
1402	A-6713-109-B	MOUNTED CIRCUIT BOARD, AU-21 (SERIAL NO. NOTE 5 AND HIGHER)
1403	A-6725-231-A	MOUNTED CIRCUIT BOARD, BS-3
1404	A-6725-245-A	MOUNTED CIRCUIT BOARD, RS-6
1405	X-3668-754-0	SHIELD ASS'Y, MP
1406	X-3668-757-0	SHIELD ASS'Y, AU
1407	1-507-251-XX	JACK
1408	1-507-473-XX	JACK, JM-35, M-7A
1409	1-507-732-00	JACK, PIN 2P
1410	1-508-945-00	RECEPTACLE, 7P, (M)
1411	1-509-891-00	RECEPTACLE, BNC
1412	1-516-970-00	SWITCH, SLIDE
1413	1-561-045-00	RECEPTACLE, 7P, (F)
1415	1-604-971-00	PRINTED CIRCUIT BOARD, CB-6
1416	3-437-228-00	INSULATOR, JACK
1417	3-437-229-01	INSULATOR (B), JACK
1418	3-531-576-11	RIVET
1419	3-654-545-00	SPACER, BNC (SERIAL NO. UP TO NOTE 4)
	3-669-984-00	WASHER (DIA. 9.6) (SERIAL NO. NOTE 5 AND HIGHER)
1421	3-668-841-00	BRACKET, 2P PIN JACK
1422	3-668-848-00	PANEL, AU CONNECTOR
1423	3-668-852-00	PANEL, MP CONNECTOR (SERIAL NO. UP TO NOTE 4)
	3-668-852-04	PANEL, MP CONNECTOR (SERIAL NO. NOTE 5 AND HIGHER)
1424	3-668-956-00	PLATE (E), ORNAMENTAL, REAR (L)
1425	3-668-982-00	SHIELD (M), PO
1426	3-668-984-00	SHIELD (P), PO
1427	3-668-985-00	LID (M), SHIELD, LO
1428	3-668-987-00	LID (P), SHIELD, LO
1429	3-669-915-00	SHIELD (P), RP
1430	3-669-917-03	SHIELD (M), RP
1431	3-669-921-00	SHIELD (M), RO
1432	3-669-923-00	SHIELD (P), RO
1433	A-6711-275-A	MOUNTED CIRCUIT BOARD, "DM-22"
1434	1-561-336-00	RECEPTACLE, COAXIAL (SERIAL NO. NOTE 5 AND HIGHER)
1435	3-703-845-01	LABEL (N), MAIN CAUTION

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- The shaded and **Δ**-marked components are critical to safety. Replace only with same components as specified.
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 - Item with no part number and/or no description are not stocked because they are seldom required for routine service.
 - USA... #17510
CND... #20660
 - USA... #17511
CND... #20661

ORNAMENTAL PANEL (1) ORNAMENTAL PANEL (1)

Ornamental Panel

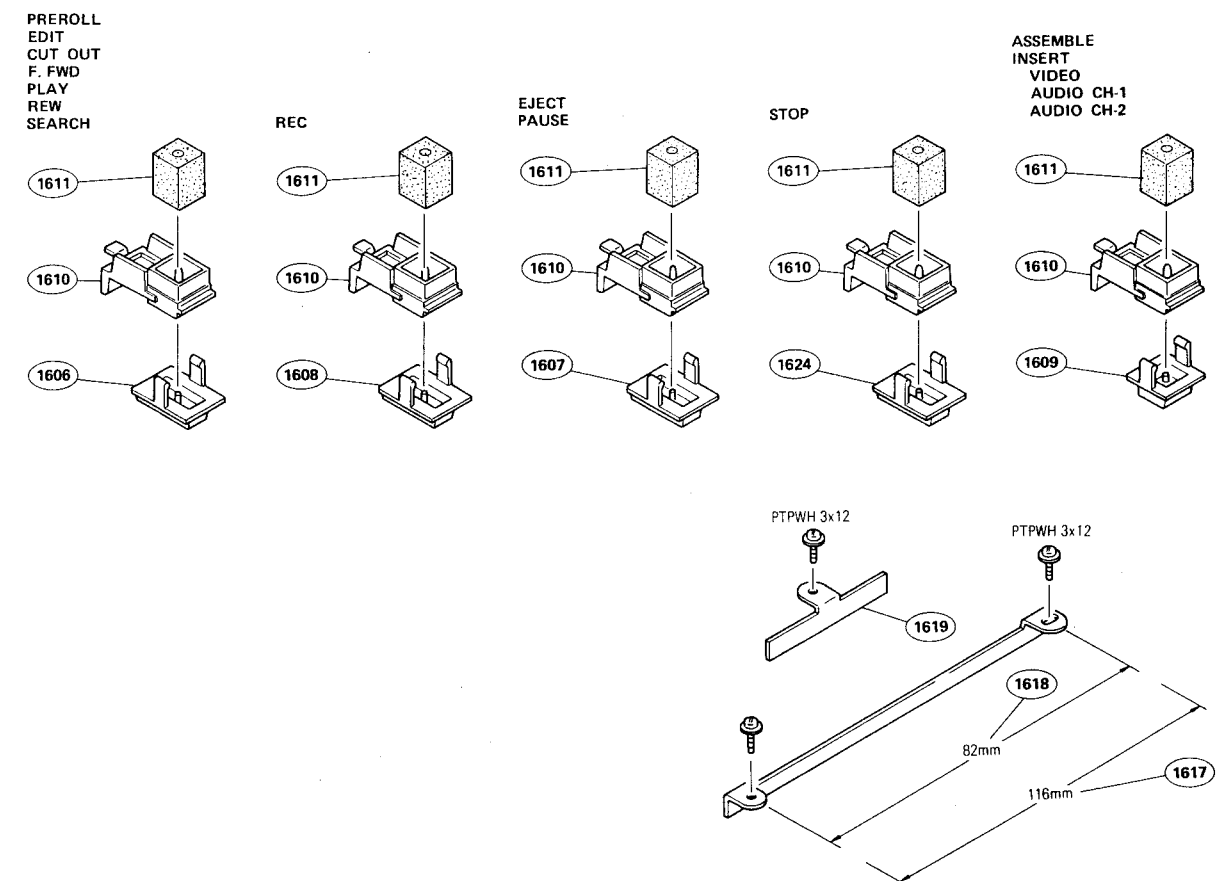


No.	Parts No.	Description
1501	X-3668-744-0	PLATE ASS'Y, SIDE
1502	X-4839-902-X	FOOT
1503	3-668-921-00	HANDLE (U... S/N UP TO 22790) (C... S/N UP TO 20860)
1504	3-668-941-00	PLATE, BOTTOM (U... S/N UP TO 22790) (C... S/N UP TO 20860)
	3-668-941-03	PLATE, BOTTOM (U... S/N 22791 AND HIGHER) (C... S/N 20861 AND HIGHER)
1505	3-703-848-01	LABEL (N), SUB CAUTION
1506	3-668-940-00	PANEL, UPPER
1507	3-669-948-00	INSULATOR, BOTTOM PLATE

- NOTE:
- The shaded and ⚠-marked components are critical to safety. Replace only with same components as specified.
 - Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
 - Item with no part number and/or no description are not stocked because they are seldom required for routine service.

ORNAMENTAL PANEL (2)

This exploded view diagram illustrates the assembly of the Sony CCD-1600 control panel. The main components shown are the front panel (1601) and the control panel (1604). The front panel features a handle (1605), a Sony logo (1626), and various control buttons and switches including AUDIO LEVEL, VIDEO TRACKING LEVEL, CH1, CH2, AUDIO, VIDEO, STILL, and AUTO. The control panel includes a large volume knob (1622), a power switch (1620), and numerous function buttons such as EJECT, PREVIEW, REC, EDIT, CUE/TIME, PAUSE, STILL, PLAY, FF, and STILL. The diagram also shows the internal wiring and the placement of various screws and fasteners, including PTTWH 3x6 screws (1613), B 3x6 screws (1602, 1615, 1616), and a B 3x6 screw (1603). The assembly is shown in a disassembled state to clearly identify each part and its location on the main unit.

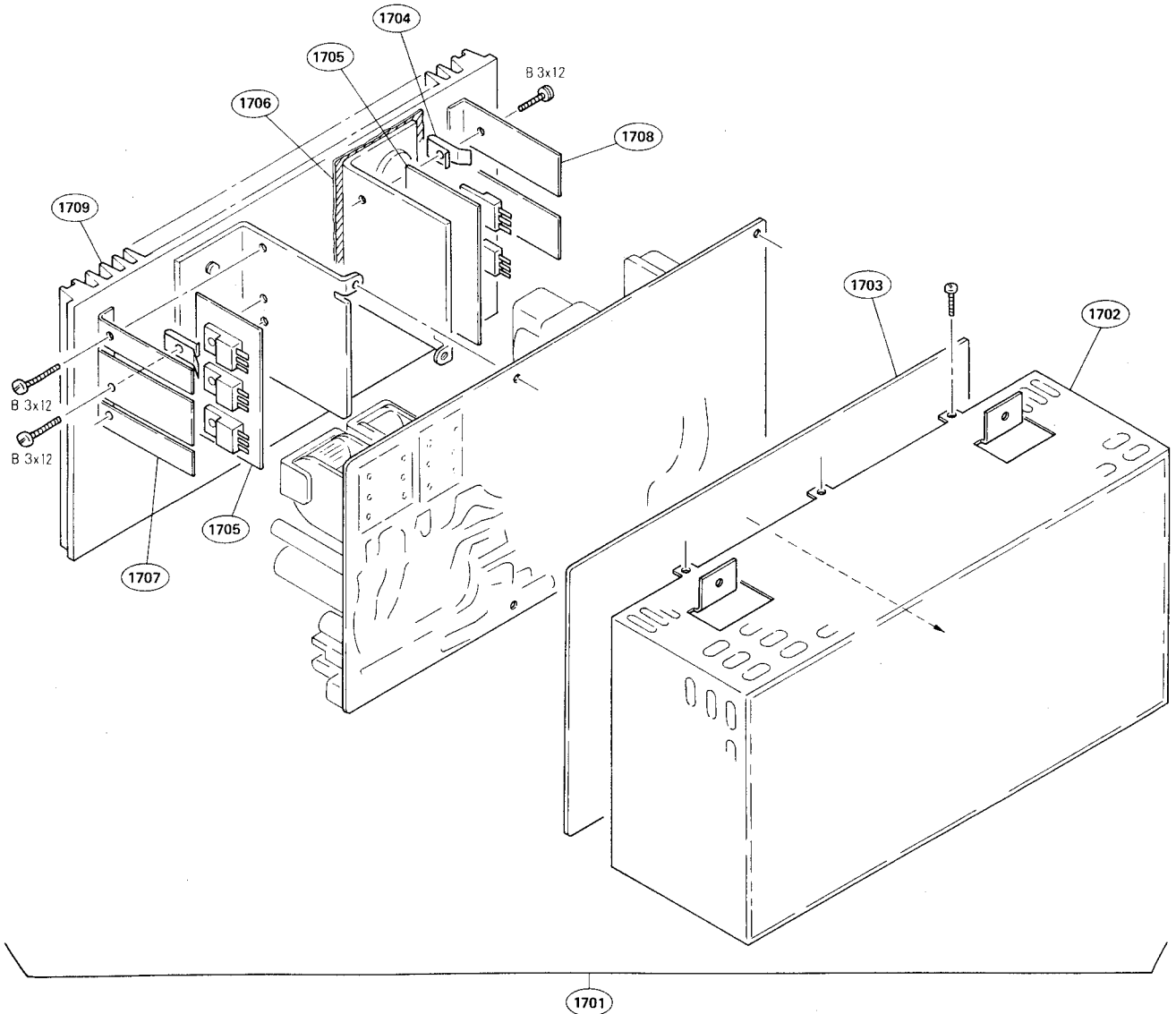


No.	Parts No.	Description
1621	3-668-907-00	SPRING
1622	3-668-908-00	COVER, EN DIAL
1623	3-668-909-00	DIAL, EN
1624	3-668-910-00	KEY TOP (STOP)
1625	3-668-913-00	LABEL, UMATIC
1626	3-668-914-00	EMBLEM, SONY
1627	3-669-909-03	PLATE, BLIND, LEVER SWITCH
1628	4-869-230-00	SPRING, COMPRESSION (U ... S/N UP TO 13690) (C ... S/N UP TO 20210)
	4-858-779-00	SPRING, COMPRESSION (U ... S/N 13691 AND HIGHER) (C ... S/N 20211 AND HIGHER)

1. The shaded and  -marked components are critical to safety.
Replace only with same components as specified.
2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in **Bold-Face type** will be processed, but allow for additional delivery time.
3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

SWITCHING REGULATOR

Switching Regulator (UR-01)



No.	Parts No.	Description
 1701	1-413-069-00	SWITCHING REGULATOR (UR-01)
1702	2-403-440-00	CASE
1703	2-430-484-00	INSULATOR
1704	2-430-683-00	SPRING
1705	2-430-685-00	RUBBER, INSULATING
1706	2-430-686-00	RUBBER, INSULATING
1707	2-430-687-00	RETAINER, SEMICONDUCTOR
1708	2-430-688-00	RETAINER, SEMICONDUCTOR
1709	2-430-689-00	HEAT SINK

NOTE:

- The shaded and  -marked components are critical to safety. Replace only with same components as specified.
- Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in **Bold-Face type** will be processed, but allow for additional delivery time.
- Item with no part number and/or no description are not stocked because they are seldom required for routine service.

15-3. ELECTRICAL PARTS LIST

Parts that are not listed in the "reference numbers order list" are shown in following table.

Reference numbers are omitted.

CERAMIC CAPACITOR

0.5 pF through 820 pF
50WV



Value	Parts No.
0.5 pF	1-101-837-00
1	1-102-934-00
1.5	1-101-576-00
2	1-102-935-00
3	1-102-936-00
4	1-102-937-00
5	1-102-942-00
6	1-102-943-00
7	1-102-944-00
8	1-102-945-00
9	1-102-946-00
10	1-102-947-00
11	1-102-948-00
12	1-102-949-00
13	1-102-950-00
15	1-102-951-00
16	1-102-952-00
18	1-102-953-00
20	1-102-958-00
22	1-102-959-00

Value	Parts No.
24 pF	1-102-960-00
27	1-102-961-00
30	1-102-962-00
33	1-102-963-00
36	1-102-964-00
39	1-102-965-00
43	1-102-966-00
47	1-101-880-00
51	1-101-882-00
56	1-101-884-00
62	1-101-886-00
68	1-101-888-00
75	1-101-890-00
82	1-102-971-00
91	1-102-972-00
100	1-102-973-00
110	1-102-815-00
120	1-102-816-00
130	1-101-081-00
150	1-101-361-00

Value	Parts No.
160 pF	1-101-367-00
180	1-102-976-00
200	1-102-977-00
220	1-102-978-00
240	1-102-979-00
270	1-102-980-00
300	1-102-981-00
330	1-102-820-00
360	1-102-821-00
390	1-102-822-00
430	1-102-823-00
470	1-102-824-00
510	1-101-059-00
560	1-102-115-00
680	1-102-116-00
820	1-102-117-00

CERAMIC CAPACITOR

0.001 μ F through 0.1 μ F
50WV

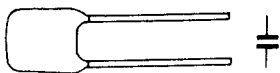


Parts NO. 1-161-□□□-00

Value	Parts No. -□□□-	Substitute
0.001 μ F	039	(1-102-074-00)
0.0012	040	
0.0015	041	
0.0018	042	
0.0022	043	(1-102-100-00)
0.0027	044	
0.0033	045	
0.0039	046	(1-102-124-00)
0.0047	047	
0.0056	048	
0.0068	049	
0.0082	050	

Value	Parts No. -□□□-	Substitute
0.01 μ F	051	(1-101-118-00)
0.012	052	
0.015	053	
0.018	054	
0.022	055	(1-101-005-00)
0.027	056	
0.033	057	
0.039	058	
0.047	059	(1-101-006-00)
0.056	060	
0.068	061	
0.082	062	
0.1	063	

MYLAR CAPACITOR



0.001 μ F through 0.22 μ F
 $\pm$ 5% 50WV

Parts No. 1-108-□□□-00

Value	Parts No. -□□□-
0.001 μ F	555
0.0011	556
0.0012	557
0.0013	558
0.0015	559
0.0016	560
0.0018	561
0.0020	562
0.0022	563
0.0024	564
0.0027	565
0.0030	566
0.0033	567
0.0036	568
0.0039	569

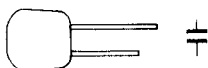
Value	Parts No. -□□□-
0.0043 μ F	570
0.0047	571
0.0051	572
0.0056	573
0.0062	574
0.0068	575
0.0075	576
0.0082	577
0.0091	578
0.01	579
0.011	580
0.012	581
0.013	582
0.015	583
0.016	584

Value	Parts No. -□□□-
0.018 μ F	585
0.020	586
0.022	587
0.024	588
0.027	589
0.030	590
0.033	591
0.036	592
0.039	593
0.043	594
0.047	595
0.051	596
0.056	597
0.062	598
0.068	599

Value	Parts No. -□□□-
0.075 μ F	600
0.082	601
0.091	602
0.1	603
0.11	604
0.12	605
0.13	606
0.15	607
0.16	608
0.18	609
0.20	610
0.22	611

SILVERED MICA CAPACITOR

1 pF through 620 pF
 $\pm$ 5%, 50WV



Parts No. 1-107-□□□-00

Value	Parts No. -□□□-
1 pF	098
2	099
3	100
4	101
5	102
6	103
7	104
8	105
9	106
10	061
11	062
12	063
13	064

Value	Parts No. -□□□-
15 pF	065
16	066
18	067
20	068
22	069
24	070
27	071
30	072
33	073
36	074
39	075
43	076
47	077

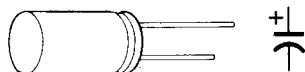
Value	Parts No. -□□□-
51 pF	078
56	079
62	080
68	081
75	082
82	083
91	084
100	085
110	086
120	087
130	088
150	089
160	090

Value	Parts No. -□□□-
180 pF	091
200	092
220	093
240	094
270	095
300	096
330	097
360	231
390	232
430	233
470	234
510	235
560	236
620	237

ELECTROLYTIC CAPACITOR

0.47 μ F through 470 μ F

6.3WV through 50 (63, 100)WV

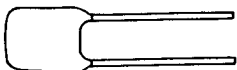


E. PARTS

Parts No. 1-123-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
0.47 μ F 50V		22 μ F 35V	342	100 μ F 50V	360
100	379	50		220 6.3	
1 50		63	371	10	308
100	380	33 6.3		16	321
2.2 50		10		25	334
100	381	16	318	35	346
3.3 25		25		50	361
35		35	343	330 6.3	
50		50		10	309
100	382	63	372	16	322
4.7 25		47 6.3		25	335
35		10	306	35	347
50		16		50	362
63	369	25	332	470 6.3	298
10 10		35		10	310
16		50	359	16	323
25		100 6.3		25	336
35		10	307	35	348
50	356	16		50	
22 16		25	333	63	377
25	330	35	345		

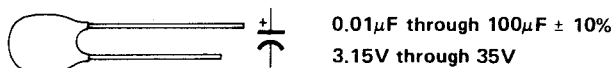
MYLAR CAPACITOR

0.00047 μ F through 0.22 μ F
±5% 50WV

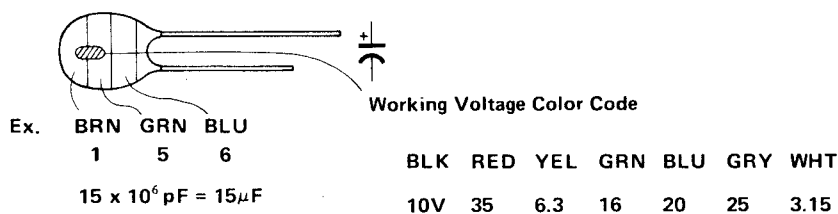
Parts No. 1-130-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
0.00047 μ F	467	0.0039 μ F	478	0.033 μ F	489
0.00056	468	0.0047	479	0.039	490
0.00068	469	0.0056	480	0.047	491
0.00082	470	0.0068	481	0.056	492
0.001	471	0.0082	482	0.068	493
0.0012	472	0.01	483	0.082	494
0.0015	473	0.012	484	0.1	495
0.0018	474	0.015	485	0.12	496
0.0022	475	0.018	486	0.15	497
0.0027	476	0.022	487	0.18	498
0.0033	477	0.027	488	0.22	499

TANTALUM CAPACITOR



NOTE: The value of the parts that are marked by * in the below table are indicated by color code. (to the value with ±20%)



Parts No. 1-131-□□□-00

Value	Parts No. -□□□-
0.01µ	35V *396
0.015	35 *397
0.022	35 *398
0.033	35 *399
0.047	35 *400
0.068	35 *401
0.1	35 341
0.15	35 342
0.22	35 343
0.33	25 *409
	35 344
0.47	20 *412
	35 345
0.68	16 *415
	25 *410
	35 346
1.0	10 *418
	25 498

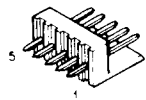
Value	Parts No. -□□□-
1.0µ	35V 347
1.5	6.3 *421
	20 499
	25 354
	35 348
2.2	3.15 *424
	16 500
	20 361
	25 355
	35 349
3.3	10 501
	16 368
	20 362
	25 356
	35 350
4.7	6.3 502
	10 375
	16 369

Value	Parts No. -□□□-
4.7µ	20V 363
	25 357
	35 351
6.8	3.15 503
	6.3 382
	10 376
	16 370
	20 364
	25 358
	35 352
10	3.15 389
	6.3 383
	10 377
	16 371
	20 365
	25 359
	35 353
15	3.15 390
	6.3 384

Value	Parts No. -□□□-
15µ	10V 378
	16 372
	20 366
	25 360
22	3.15 391
	6.3 385
	10 379
	16 373
	20 367
33	3.15 392
	6.3 386
	10 380
	16 374
47	3.15 393
	6.3 387
	10 381
68	3.15 394
	6.3 388
100	3.15 395

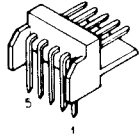
CONNECTOR

top-type receptacle



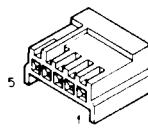
3P	1-560-008-00
5P	1-560-009-00
6P	1-560-010-00
8P	1-560-011-00
10P	1-560-012-00
12P	1-560-013-00

side-type receptacle



3P	1-560-014-00
5P	1-560-015-00
6P	1-560-016-00
8P	1-560-017-00
10P	1-560-018-00
12P	1-560-019-00

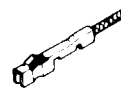
housing



3P	1-561-155-00
5P	1-561-156-00
6P	1-561-157-00
8P	1-561-158-00
10P	1-561-159-00
12P	1-561-160-00

plug

contact

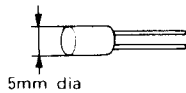


1-560-006-00
(AWG 20 ~ 26)

1-560-007-00
(AWG 26 ~ 30)

MICRO INDUCTOR

1 μ H through 470 μ H
 $\pm 5\%$



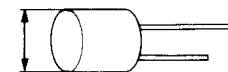
5mm dia

Parts No. 1-407-□□□-XX

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1 μ H	178	4.7 μ H	186	22 μ H	161	100 μ H	169
1.2	179	5.6	187	27	162	120	170
1.5	180	6.8	188	33	163	150	171
1.8	181	8.2	189	39	164	180	172
2.2	182	10	157	47	165	220	173
2.7	183	12	158	56	166	270	174
3.3	184	15	159	68	167	330	175
3.9	185	18	160	82	168	390	176
						470	177

MICRO INDUCTOR

470 μ H through 33 mH
 $\pm 5\%$



10mm dia

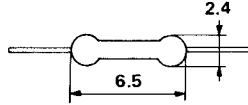
Parts No. 1-407-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
470 μ H	488	1.5 mH	494	4.7 mH	500	15 mH	506
560	489	1.8	495	5.6	501	18	507
680	490	2.2	496	6.8	502	22	508
820	491	2.7	497	8.2	503	27	509
1 mH	492	3.3	498	10	504	33	510
1.2	493	3.9	499	12	505		

RESISTOR

CARBON RESISTOR (1/4W)

± 5%, 1/4W, non-special type
1 Ω through 1 MΩ



E. PARTS

Parts No. 1-246-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1 Ω	401	33 Ω	437	1 kΩ	473	33 kΩ	509
1.1	402	36	438	1.1	474	36	510
1.2	403	39	439	1.2	475	39	511
1.3	404	43	440	1.3	476	43	512
1.5	405	47	441	1.5	477	47	513
1.6	406	51	442	1.6	478	51	514
1.8	407	56	443	1.8	479	56	515
2	408	62	444	2	480	62	516
2.2	409	68	445	2.2	481	68	517
2.4	410	75	446	2.4	482	75	518
2.7	411	82	447	2.7	483	82	519
3	412	91	448	3.0	484	91	520
3.3	413	100 Ω	449	3.3	485	100 kΩ	521
3.6	414	110	450	3.6	486	110	522
3.9	415	120	451	3.9	487	120	523
4.3	416	130	452	4.3	488	130	524
4.7	417	150	453	4.7	489	150	525
5.1	418	160	454	5.1	490	160	526
5.6	419	180	455	5.6	491	180	527
6.2	420	200	456	6.2	492	200	528
6.8	421	220	457	6.8	493	220	529
7.5	422	240	458	7.5	494	240	530
8.2	423	270	459	8.2	495	270	531
9.1	424	300	460	9.1	496	300	532
10 Ω	425	330	461	10 kΩ	497	330	533
11	426	360	462	11	498	360	534
12	427	390	463	12	499	390	535
13	428	430	464	13	500	430	536
15	429	470	465	15	501	470	537
16	430	510	466	16	502	510	538
18	431	560	467	18	503	560	539
20	432	620	468	20	504	620	540
22	433	680	469	22	505	680	541
24	434	750	470	24	506	750	542
27	435	820	471	27	507	820	543
30	436	910	472	30	508	910	544
						1 MΩ	545

CARBON RESISTOR (1/8W)

±5%, 1/8W, non-special type
2.2Ω through 1MΩ



Parts No. 1-246-□□□-00

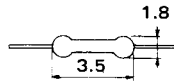
Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1Ω	—	33Ω	765	1kΩ	783	33kΩ	801
1.1	—	36	826	1.1	844	36	862
1.2	—	39	766	1.2	784	39	802
1.3	—	43	827	1.3	845	43	863
1.5	—	47	767	1.5	785	47	803
1.6	—	51	828	1.6	846	51	864
1.8	—	56	768	1.8	786	56	804
2	—	62	829	2	847	62	865
2.2	751	68	769	2.2	787	68	805
2.4	812	75	830	2.4	848	75	866
2.7	752	82	770	2.7	788	82	806
3	813	91	831	3.0	849	91	867
3.3	753	100Ω	771	3.3	789	100kΩ	807
3.6	814	110	832	3.6	850	110	868
3.9	754	120	772	3.9	790	120	808
4.3	815	130	833	4.3	851	130	869
4.7	755	150	773	4.7	791	150	809
5.1	816	160	834	5.1	852	160	870
5.6	756	180	774	5.6	792	180	810
6.2	817	200	835	6.2	853	200	871
6.8	757	220	775	6.8	793	220	811
7.5	818	240	836	7.5	854		
8.2	758	270	776	8.2	794		
9.1	819	300	837	9.1	855		
10Ω	759	330	777	10kΩ	795		
11	820	360	838	11	856		
12	760	390	778	12	796		
13	821	430	839	13	857		
15	761	470	779	15	797		
16	822	510	840	16	858		
18	762	560	780	18	798		
20	823	620	841	20	859		
22	763	680	781	22	799		
24	824	750	842	24	860		
27	764	820	782	27	800		
30	825	910	843	30	861		

Parts No. 1-247-□□□-00

Value	Parts No. -□□□-
240kΩ	054
270	046
300	055
330	047
360	056
390	048
430	057
470	049
510	058
560	050
620	059
680	051
750	060
820	052
910	061
1MΩ	053

CARBON RESISTOR (1/6W)

±5%, 1/6W, non-special type
2.2Ω through 1MΩ



Parts No. 1-247-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1Ω	—	36Ω	796	1.2kΩ	833	43kΩ	870
1.1	—	39	797	1.3	834	47	871
1.2	—	43	798	1.5	835	51	872
1.3	—	47	799	1.6	836	56	873
1.5	—	51	800	1.8	837	62	874
1.6	—	56	801	2	838	68	875
1.8	—	62	802	2.2	839	75	876
2	—	68	803	2.4	840	82	877
2.2	767	75	804	2.7	841	91	878
2.4	768	82	805	3	842	100kΩ	879
2.7	769	91	806	3.3	843	110	880
3	770	100Ω	807	3.6	844	120	881
3.3	771	110	808	3.9	845	130	882
3.6	772	120	809	4.3	846	150	883
3.9	773	130	810	4.7	847	160	884
4.3	774	150	811	5.1	848	180	885
4.7	775	160	812	5.6	849	200	886
5.1	776	180	813	6.2	850	220	887
5.6	777	200	814	6.8	851	240	888
6.2	778	220	815	7.5	852	270	889
6.8	779	240	816	8.2	853	300	890
7.5	780	270	817	9.1	854	330	891
8.2	781	300	818	10kΩ	855	360	892
9.1	782	330	819	11	856	390	893
10Ω	783	360	820	12	857	430	894
11	784	390	821	13	858	470	895
12	785	430	822	15	859	510	896
13	786	470	823	16	860	560	897
15	787	510	824	18	861	620	898
16	788	560	825	20	862	680	899
18	789	620	826	22	863	750	900
20	790	680	827	24	864	820	901
22	791	750	828	27	865	910	902
24	792	820	829	30	866	1MΩ	903
27	793	910	830	33	867		
30	794	1kΩ	831	36	868		
33	795	1.1	832	39	869		

ABBREVIATIONS

Ref. No.	Description	Ref. No.	Description	Ref. No.	Description
C□□, CV□□	CAPACITOR	IC□□	IC	Q□□	TRANSISTOR
CF□□	CERAMIC FILTER	J□□	JACK	R□□, RV□□	RESISTOR
CN□□	CONNECTOR	L□□	INDUCTOR	RY□□	RELAY
D□□	DIODE	M□□	MOTOR	S□□, SW□□	SWITCH
DL□□	DELAY LINE	ME□□	METER	SB□□	SOLAR BATTERY
F□□	FUSE	MIC□□	MICROPHONE	T□□	TRANSFORMER
FB□□	FERRITE BEAD	PG□□	PG COIL	TH□□	THERMISTOR
FL□□	FILTER	PL□□	LAMP	X□□	CRYSTAL
H□□	HEAD	PM□□	SOLENOID		

All capacitors are in micro farads unless otherwise specified.

All inductors are in micro henries unless otherwise specified.

All resistors are in ohms.

Ref. No. Parts No. Description

AC-26 BOARD

 1-603-727-00 PRINTED CIRCUIT BOARD,
AC-26

 C1 1-130-680-00 POLYPROPYLENE 0.1 10%
125V

 CN3 1-506-371-00 2P PLUG
1-509-910-00 2P HOUSING
1-509-898-00 RECEPTACLE

 F1 1-532-268-XX 125V, 2A

Ref. No. Parts No. Description

 T1 1-421-259-00 LINE FILTER

AH-3 BOARD

1-586-192-00 PRINTED CIRCUIT BOARD,
AH-3

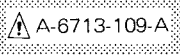
NOTES:

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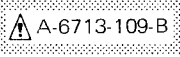
Ref. No. Parts No. Description

AU-21 BOARD

 A-6713-109-A MOUNTED CIRCUIT BOARD,
AU-21

S/N UP TO 17510 (USA)

S/N UP TO 20660 (UND)

 A-6713-109-B MOUNTED CIRCUIT BOARD,
AU-21

S/N 17511 AND LATER (USA)

S/N 20661 AND LATER (CND)

All the diodes that are not listed in this board
are 1S1555 (Parts No. 8-719-815-55)

C10	1-107-178-00	MICA 240PF 5% 500V
C11	1-107-178-00	MICA 240PF 5% 500V
C29	1-107-209-00	MICA 20PF 5% 500V
C101	1-107-158-00	MICA 30PF 5% 500V
C102	1-107-158-00	MICA 30PF 5% 500V
C210	1-107-178-00	MICA 240PF 5% 500V
C211	1-107-178-00	MICA 240PF 5% 500V
C229	1-107-209-00	MICA 20PF 5% 500V

CP501	1-464-139-00	BIAS OSC.
CP502	1-464-139-00	BIAS OSC.

CV501	1-141-251-00	TRIMMER 150PF x 2
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D5	8-719-162-07	RD6.2E-B
D7	8-719-162-07	RD6.2E-B
D12	8-719-162-07	RD6.2E-B
D18	8-719-156-07	RD5.6E-B
D20	8-719-139-07	RD3.9E-B

D205	8-719-162-07	RD6.2E-B
D207	8-719-162-07	RD6.2E-B
D212	8-719-162-07	RD6.2E-B
D219	8-719-156-07	RD5.6E-B
D501	8-719-200-02	10E-2

Ref. No. Parts No. Description

D502	8-719-200-02	10E-2
D503	8-719-200-02	10E-2
D504	8-719-200-02	10E-2
D507	8-719-200-02	10E-2
D508	8-719-182-07	RD8.2E-B

D509	8-719-115-07	RD15E-B
D510	8-719-182-07	RD8.2E-B

IC1	8-759-115-83	μPC1158H2 (NEC)
IC2	8-759-115-83	μPC1158H2 (NEC)
IC3	8-759-705-58	NJM4558D-D (RC4558; RAYTHEON)
IC4	8-759-705-58	NJM4558D-D (RC4558; RAYTHEON)
IC5	8-759-240-16	TC4016BP, C-MOS (CD4016AE/BE; RCA)

IC201	8-759-115-83	μPC1158H2 (NEC)
IC202	8-759-115-83	μPC1158H2 (NEC)
IC203	8-759-705-58	NJM4558D-D (RC4558; RAYTHEON)
IC204	8-759-705-58	NJM4558D-D (RC4558; RAYTHEON)
IC501	8-759-240-16	TC4016BP, C-MOS (CD4016AE/BE; RCA)

IC901	8-720-002-96	TX-429D
IC902	8-720-002-96	TX-429D
IC903	8-720-002-96	TX-429D
IC904	8-720-002-96	TX-429D

L2	1-407-519-00	8
L202	1-407-519-00	8

LV1	1-407-576-00	VAR 220
LV2	1-409-295-00	VAR 22
LV3	1-409-295-00	VAR 22
LV201	1-407-576-00	VAR 220
LV202	1-409-295-00	VAR 22

LV203	1-409-295-00	VAR 22
LV501	1-407-284-00	VAR 1mH
LV502	1-407-284-00	VAR 1mH
LV503	1-407-284-00	VAR 1mH

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E. PARTS

Ref. No.	Parts No.	Description
Q1	8-761-622-00	2SC1636
Q2	8-729-612-77	2SA1027R
Q3	8-761-622-00	2SC1636
Q4	8-729-663-47	2SC1364
Q6	8-729-663-47	2SC1364
Q7	8-729-663-47	2SC1364
Q8	8-729-663-47	2SC1364
Q9	8-729-663-47	2SC1364
Q10	8-729-663-47	2SC1364
Q11	8-729-612-77	2SA1027R
Q12	8-729-612-77	2SA1027R
Q13	8-729-663-47	2SC1364
Q14	8-729-663-47	2SC1364
Q15	8-729-663-47	2SC1364
Q16	8-729-663-47	2SC1364
Q17	8-729-663-47	2SC1364
Q18	8-729-177-32	2SD773
Q19	8-729-663-47	2SC1364
Q201	8-761-622-00	2SC1636
Q202	8-729-612-77	2SA1027R
Q203	8-761-622-00	2SC1636
Q204	8-729-663-47	2SC1364
Q205	8-729-663-47	2SC1364
Q206	8-729-663-47	2SC1364
Q207	8-729-663-47	2SC1364
Q208	8-729-663-47	2SC1364
Q209	8-729-663-47	2SC1364
Q210	8-729-663-47	2SC1364
Q211	8-729-612-77	2SA1027R
Q212	8-729-612-77	2SA1027R
Q213	8-729-663-47	2SC1364
Q214	8-729-663-47	2SC1364
Q215	8-729-663-47	2SC1364
Q216	8-723-302-00	2SK43-2
Q217	8-761-622-00	2SC1636
Q218	8-729-177-32	2SD773
Q219	8-729-663-47	2SC1364
Q220	8-729-660-37	2SC1363
Q501	8-729-663-47	2SC1364
Q502	8-729-663-47	2SC1364
Q503	8-729-663-47	2SC1364
Q504	8-729-663-47	2SC1364
Q505	8-729-663-47	2SC1364
Q506	8-729-612-77	2SA1027R
Q507	8-729-663-47	2SC1364

Ref. No.	Parts No.	Description
Q508	8-729-663-47	2SC1364
Q509	8-729-331-53	2SC2315
Q510	8-729-374-02	2SB740
Q511	8-729-663-47	2SC1364
Q512	8-729-612-77	2SA1027R
Q513	8-729-663-47	2SC1364

Ref. No.	Parts No.	Description
R6	1-244-867-00	CARBON 560 5% 1/2W
R57	1-214-750-00	METAL 7.5K 1% 1/4W
R58	1-214-777-00	METAL 100K 1% 1/4W
R59	1-214-754-00	METAL 11K 1% 1/4W
R60	1-214-726-00	METAL 750 1% 1/4W
R206	1-244-867-00	CARBON 560 5% 1/2W
R257	1-214-750-00	METAL 7.5K 1% 1/4W
R258	1-214-777-00	METAL 100K 1% 1/4W
R259	1-214-754-00	METAL 11K 1% 1/4W
R260	1-214-726-00	METAL 750 1% 1/4W

 R516 1-207-636-00 WIREWOUND 100 10% 3W

 R517 1-207-636-00 WIREWOUND 100 10% 3W

Ref. No.	Parts No.	Description
RV1	1-224-253-XX	VAR, METAL 22K (B)
RV2	1-224-251-XX	VAR, METAL 4.7K (B)
RV3	1-224-254-XX	VAR, METAL 47K (B)
RV4	1-224-248-XX	VAR, METAL 470 (B)
RV5	1-224-253-XX	VAR, METAL 22K (B)
RV6	1-224-254-XX	VAR, METAL 47K (B)
RV201	1-224-253-XX	VAR, METAL 22K (B)
RV202	1-224-251-XX	VAR, METAL 4.7K (B)
RV203	1-224-254-XX	VAR, METAL 47K (B)
RV204	1-224-248-XX	VAR, METAL 470 (B)
RV205	1-224-253-XX	VAR, METAL 22K (B)
RV206	1-224-254-XX	VAR, METAL 47K (B)

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Ref. No.	Parts No.	Description
RY501	1-515-476-00	12V, 280 OHM
RY502	1-515-475-00	12V, 280 OHM

T1	1-427-284-00	OUTPUT
T201	1-427-284-00	OUTPUT

Ref. No.	Parts No.	Description
CC-9 BOARD		
	1-604-429-00	PRINTED CIRCUIT BOARD, CC-9

BS-3 BOARD

A-6725-231-A	MOUNTED CIRCUIT BOARD, BS-3
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All the diodes that are not listed in this board
are 1S1555 (Parts No. 8-719-815-55)

*C12	1-102-114-00	CERAMIC 470PF 10% 50V
*D1	8-719-911-19	1SS119
*D2	8-719-911-19	1SS119
*D3	8-719-911-19	1SS119
IC1	8-759-240-11	TC4011BP, C-MOS (CD4011AE/BE; RCA)
IC2	8-759-240-13	TC4013BP, C-MOS (CD4013AE/BE; RCA)
IC3	8-759-240-13	TC4013BP, C-MOS (CD4013AE/BE; RCA)
IC4	8-759-904-69	MSM4069, C-MOS (CD4069UBE; RCA)
IC5	8-759-240-15	TC4015BP, C-MOS (CD4015AE/BE; RCA)
IC6	8-759-345-38	HD14538BP, C-MOS (MC14538BCP; MOTOROLA)
*IC4	8-759-045-84	MC14584BCP, C-MOS
*IC7	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)
*IC8	8-759-240-30	TC4030BP, C-MOS (CD4030BE; RCA)
Q1	8-729-663-47	2SC1364
Q2	8-729-663-47	2SC1364

CC-10 BOARD

1-604-430-00	PRINTED CIRCUIT BOARD, CC-10
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IC1	8-719-104-42	PS4005 (NEC)
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CC-11 BOARD

1-604-431-00	PRINTED CIRCUIT BOARD, CC-11
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IC1	8-719-104-42	PS4005 (NEC)
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* S/N 13691 AND LATER (USA)
S/N 20211 AND LATER (CND)

NOTES:

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DC-10, DM-22, DL-2

E. PARTS

Ref. No. Parts No. Description

DC-10 BOARD

 A-6723-161-A MOUNTED CIRCUIT BOARD, DC-10

All the diodes that are not listed in this board are 1S1555 (Parts No. 8-719-815-55)

D31	8-719-200-02	10E-2
D32	8-719-200-02	10E-2
D33	8-719-200-02	10E-2
D34	8-719-200-02	10E-2
D51	8-719-911-55	U05G

 F1 1-532-403-XX 125V, 3.15A

IC1 8-759-145-58 μ PC4558C (RC4558; RAYTHEON)

Q1	8-729-663-47	2SC1364
Q31	8-729-177-32	2SD773
Q32	8-729-177-32	2SD773
Q51	8-729-663-47	2SC1364
Q52	8-729-315-63	2SB856

R1	1-214-144-00	METAL 3.3K 1% 1/4W
R2	1-214-143-00	METAL 3K 1% 1/4W
R3	1-214-171-00	METAL 43K 1% 1/4W
R4	1-214-168-00	METAL 33K 1% 1/4W

 R31 1-207-636-11 WIREWOUND 100 10% 2W

 R32 1-207-636-11 WIREWOUND 100 10% 2W

 R51 1-207-621-00 WIREWOUND 1.5 10% 2W

Ref. No. Parts No. Description

DM-22, DL-2 BOARD

A-6711-275-A MOUNTED CIRCUIT BOARD, DM-22 WITH DL-2

1-602-808-00 PRINTED CIRCUIT BOARD, DL-2

All the diodes that are not listed in this board are 1S1555 (Parts No. 8-719-815-55)

C17	1-107-211-00	MICA 24PF 5% 500V
C24	1-109-690-00	MICA 510PF 1% 500V
C25	1-107-202-00	MICA 10PF 5% 500V
C26	1-107-209-00	MICA 20PF 5% 500V
C57	1-107-203-00	MICA 11PF 5% 500V

C58	1-107-042-00	MICA 2.2PF 500V
C64	1-107-158-00	MICA 30PF 5% 500V
C84	1-107-206-00	MICA 15PF 5% 500V
C95	1-107-211-00	MICA 24PF 5% 500V
C104	1-107-048-00	MICA 6.8PF 0.5PF 500V

C105	1-107-159-00	MICA 33PF 5% 500V
C120	1-107-205-00	MICA 13PF 5% 500V
C122	1-107-208-00	MICA 18PF 5% 500V
C130	1-107-210-00	MICA 22PF 5% 500V
C144	1-107-159-00	MICA 33PF 5% 500V

C145	1-107-048-00	MICA 6.8PF 0.5PF 500V
C148	1-107-048-00	MICA 6.8PF 0.5PF 500V
C155	1-123-311-00	ELECT 1000 20% 10V
C156	1-123-311-00	ELECT 1000 20% 10V
C157	1-123-311-00	ELECT 1000 20% 10V

C401	1-107-042-00	MICA 2.2PF 500V
C405	1-107-049-00	MICA 8.2PF 500V
C421	1-107-204-00	MICA 12PF 5% 500V

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Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
C426	1-107-204-00	MICA 12PF 5% 500V	IC18	8-759-969-13	SN16913P (TI)
C427	1-107-204-00	MICA 12PF 5% 500V	IC19	8-749-938-90	BX-389 (SONY)
C428	1-107-209-00	MICA 20PF 5% 500V	IC20	8-749-938-90	BX-389 (SONY)
C431	1-107-048-00	MICA 6.8PF 0.5PF 500V	IC21	8-749-938-80	BX-388 (SONY)
C601	1-107-049-00	MICA 8.2PF 0.5PF 500V	IC25	8-751-300-00	CX-130 (SONY)
C803	1-107-208-00	MICA 18PF 5% 500V	IC26	8-759-270-60	TA7060P (TOSHIBA)
CV1	1-141-246-00	TRIMMER 15P	LV37	1-407-570-00	VAR, 15
			LV42	1-407-566-00	VAR. 3.3
DL1	1-415-096-00	0.3 μ s	Q1	8-724-375-01	2SC403C
DL2	1-415-231-00	0.3 μ s	Q2	8-729-612-77	2SA1027R
DL4	1-415-231-00	0.3 μ s	Q3	8-724-375-01	2SC403C
DL5	1-415-249-00	140ns	Q4	8-724-375-01	2SC403C
DL7	1-415-250-21	1H	Q5	8-761-622-00	2SC1636
*DL1	1-415-096-31	0.3 μ s	Q6	8-761-622-00	2SC1636
*DL2	1-415-231-21	0.3 μ s	Q7	8-724-375-01	2SC403C
*DL4	1-415-231-21	0.3 μ s	Q8	8-724-375-01	2SC403C
			Q9	8-724-375-01	2SC403C
FL1	1-235-047-00	BPF	Q11	8-729-612-77	2SA1027R
FL2	1-231-579-00	LPF	Q12	8-729-663-47	2SC1364
FL3	1-235-002-00	LPF	Q13	8-729-663-47	2SC1364
FL4	1-235-044-00	LPF	Q14	8-761-622-00	2SC1636
*FL2	1-231-579-21	LPF	Q15	8-724-375-01	2SC403C
			Q16	8-729-612-77	2SA1027R
IC1	8-759-245-28	TC4528BP, C-MOS (MC14528BCP; MOTOROLA)	Q17	8-761-622-00	2SC1636
IC2	8-759-245-28	TC4528BP, C-MOS (MC14528BCP; MOTOROLA)	Q18	8-724-375-01	2SC403C
IC3	8-759-990-82	TL082CP (TI)	Q19	8-729-663-47	2SC1364
IC4	8-751-350-00	CX-135 (SONY)	Q20	8-729-663-47	2SC1364
IC5	8-759-908-59	CX-859 (SONY)	Q21	8-761-622-00	2SC1636
IC6	8-751-300-00	CX-130 (SONY)	Q22	8-761-622-00	2SC1636
IC7	8-750-000-46	CX-872 (SONY)	Q23	8-761-622-00	2SC1636
IC8	8-759-345-38	HD14538BP, C-MOS (MC14538BCP; MOTOROLA)	Q24	8-724-375-01	2SC403C
IC9	8-759-013-30	MC1330AP (MOTOROLA)	Q25	8-724-375-01	2SC403C
IC11	8-759-270-60	TA7060P (TOSHIBA)	Q26	8-761-622-00	2SC1636
IC12	8-749-938-90	BX-389 (SONY)	Q27	8-761-622-00	2SC1636
IC14	8-751-300-00	CX-130 (SONY)	Q28	8-761-622-00	2SC1636
IC15	8-759-969-13	SN16913P (TI)	Q29	8-729-663-47	2SC1364
IC16	8-759-270-60	TA7060P (TOSHIBA)	Q30	8-729-612-77	2SA1027R
IC17	8-759-969-13	SN16913P (TI)	Q31	8-761-622-00	2SC1636
			Q32	8-724-375-01	2SC403C
			Q33	8-724-375-01	2SC403C
			Q34	8-724-375-01	2SC403C
			Q35	8-729-612-77	2SA1027R
			Q36	8-724-375-01	2SC403C

* S/N 21691 AND LATER (USA)
S/N 20861 AND LATER (CND)

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DM-22, DL-2, EC-19, FR-11

E. PARTS

Ref. No.	Parts No.	Description
Q37	8-761-622-00	2SC1636
Q38	8-761-622-00	2SC1636
Q39	8-724-375-01	2SC403C
Q401	8-724-375-01	2SC403C
Q402	8-724-375-01	2SC403C
Q403	8-724-375-01	2SC403C
Q404	8-729-663-47	2SC1364
Q405	8-729-612-77	2SA1027R
Q406	8-761-622-00	2SC1636
Q407	8-724-375-01	2SC403C
Q601	8-724-375-01	2SC403C
Q602	8-729-612-77	2SA1027R
Q603	8-761-622-00	2SC1636
Q604	8-729-663-47	2SC1364
Q605	8-761-622-00	2SC1636
Q950	8-724-375-01	2SC403C
Q951	8-761-622-00	2SC1636
Q960	8-729-612-77	2SA1027R
R32	1-214-130-00	METAL 820 1% 1/4W
R34	1-214-119-00	METAL 300 1% 1/4W
RV1	1-224-660-00	VAR, METAL 1K
RV2	1-224-253-XX	VAR, METAL 22K (B)
RV3	1-224-253-XX	VAR, METAL 22K (B)
RV4	1-224-253-XX	VAR, METAL 22K (B)
RV5	1-224-253-XX	VAR, METAL 22K (B)
RV6	1-224-250-XX	VAR, METAL 2.2K (B)
RV7	1-224-250-XX	VAR, METAL 2.2K (B)
RV8	1-224-134-XX	VAR, METAL 470K (B)
RV9	1-224-251-XX	VAR, METAL 4.7K (B)
RV10	1-224-251-XX	VAR, METAL 4.7K (B)
RV12	1-224-253-XX	VAR, METAL 22K (B)
RV15	1-224-550-21	VAR, METAL 220 (B)
RV16	1-224-249-XX	VAR, METAL 1K (B)
RV17	1-224-252-XX	VAR, METAL 10K (B)
RV18	1-224-250-XX	VAR, METAL 2.2K (B)
RV19	1-224-248-XX	VAR, METAL 470 (B)
RV20	1-224-254-XX	VAR, METAL 47K (B)
RV21	1-224-250-XX	VAR, METAL 2.2K (B)
RV22	1-224-550-21	VAR, METAL 220 (B)
RV23	1-224-253-XX	VAR, METAL 22K (B)
RV61	1-224-255-XX	VAR, METAL 100K (B)
RV71	1-224-134-XX	VAR, METAL 470K (B)
RV401	1-224-250-XX	VAR, METAL 2.2K (B)
RV402	1-224-250-XX	VAR, METAL 2.2K (B)

Ref. No.	Parts No.	Description
S1	1-552-101-00	SLIDE "NOISE CANCEL"
T1	1-425-982-00	BPT
T2	1-425-785-21	BURST AMP.
T3	1-411-104-00	BPT
X1	1-527-536-00	OSC. 3.579545 MHz
X2	1-527-829-00	OSC. 9.300500 MHz

EC-19 BOARD

1-603-729-00 PRINTED CIRCUIT BOARD,
EC-19

FR-11 BOARD

1-603-585-00 PRINTED CIRCUIT BOARD,
FR-11

IC1	8-719-104-42	PS4005 (NEC)
IC2	8-719-104-42	PS4005 (NEC)

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Ref. No. Parts No. Description

HP-3 BOARD

1-603-734-00 PRINTED CIRCUIT BOARD,
HP-3

KY-13, DP-10 BOARD

A-6728-290-A MOUNTED CIRCUIT BOARD,
KY-13 WITH DP-10

1-603-733-00 PRINTED CIRCUIT BOARD,
DP-10

C3 1-102-110-00 CERAMIC 220PF 10% 50V
C4 1-102-110-00 CERAMIC 220PF 10% 50V
C5 1-102-110-00 CERAMIC 220PF 10% 50V
C6 1-102-110-00 CERAMIC 220PF 10% 50V
C7 1-102-110-00 CERAMIC 220PF 10% 50V

C8 1-102-121-00 CERAMIC 0.0022 10% 50V
C9 1-102-121-00 CERAMIC 0.0022 10% 50V
C10 1-102-121-00 CERAMIC 0.0022 10% 50V
C11 1-102-121-00 CERAMIC 0.0022 10% 50V
C12 1-102-121-00 CERAMIC 0.0022 10% 50V

C13 1-102-121-00 CERAMIC 0.0022 10% 50V
C14 1-102-121-00 CERAMIC 0.0022 10% 50V
C15 1-102-121-00 CERAMIC 0.0022 10% 50V

CN1 1-508-857-00 PIN

D1 8-719-911-19 1SS119
D5 8-719-911-19 1SS119
D6 8-719-911-19 1SS119
D7 8-719-904-55 GL-5HD5
D8 8-719-911-19 1SS119

Ref. No. Parts No. Description

D9 8-719-911-19 1SS119
D11 8-719-911-19 1SS119
D12 8-719-911-19 1SS119
D13 8-719-904-55 GL-5HD5
D14 8-719-911-19 1SS119

D15 8-719-904-55 GL-5HD5
D16 8-719-911-19 1SS119
D17 8-719-911-19 1SS119
D18 8-719-904-55 GL-5HD5
D19 8-719-904-55 GL-5HD5

D20 8-719-911-19 1SS119
D21 8-719-904-55 GL-5HD5
D22 8-719-904-55 GL-5HD5
D23 8-719-911-19 1SS119
D24 8-719-911-19 1SS119

D25 8-719-911-19 1SS119
D26 8-719-911-19 1SS119
D27 8-719-904-55 GL-5HD5
D28 8-719-911-19 1SS119
D29 8-719-911-19 1SS119

D30 8-719-904-55 GL-5HD5
D31 8-719-911-19 1SS119
D32 8-719-911-19 1SS119
D33 8-719-904-55 GL-5HD5
D34 8-719-904-55 GL-5HD5

D501 8-719-912-22 SL-1222
D502 8-719-912-22 SL-1222
D503 8-719-951-02 LD-001UR-JK

IC1 8-759-645-16 M54516P (MITSUBISHI)
IC2 8-759-245-43 TC4543BP, C-MOS (MC14543BCP;
MOTOROLA)
IC3 8-759-240-42 TC4042BP, C-MOS (CD4042AE/BE;
RCA)
IC4 8-759-345-03 HD14503BP, C-MOS (MC14503BCP;
MOTOROLA)

PL1 1-518-262-00 PILOT 5V, 60mA
PL2 1-518-262-00 PILOT 5V, 60mA
PL3 1-518-262-00 PILOT 5V, 60mA
PL4 1-518-262-00 PILOT 5V, 60mA
PL5 1-518-262-00 PILOT 5V, 60mA

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KY-13, DP-10, LM-7, MC-17, MI-3

E. PARTS

Ref. No.	Parts No.	Description
Q1	8-729-612-77	2SA1027R
Q2	8-729-612-77	2SA1027R
Q3	8-729-612-77	2SA1027R
Q4	8-729-612-77	2SA1027R
Q5	8-729-612-77	2SA1027R
Q6	8-729-612-77	2SA1027R
Q7	8-729-612-77	2SA1027R
Q8	8-729-606-33	2SC2603-F
Q9	8-729-606-33	2SC2603-F
Q10	8-729-606-33	2SC2603-F
Q11	8-729-606-33	2SC2603-F

S1	1-552-539-00	KEY "RESET"
S3	1-552-539-00	KEY "MARK IN-2"
S4	1-553-003-00	SLIDE "MEMORY"
S5	1-552-539-00	KEY "SEARCH"
S6	1-552-539-00	KEY "CUT OUT"
S7	1-552-539-00	KEY "PAUSE"
S8	1-552-539-00	KEY "EDIT"
S9	1-552-539-00	KEY "FF"
S10	1-552-539-00	KEY "REC"
S11	1-552-539-00	KEY "PLAY"
S12	1-552-539-00	KEY "PREROLL"
S13	1-552-539-00	KEY "REW"
S14	1-552-539-00	KEY "EJECT"
S15	1-552-539-00	KEY "STOP"
S16	1-552-539-00	KEY "AUDIO-2"
S17	1-516-995-00	SLIDE "INPUT SELECT"
S18	1-552-539-00	KEY "AUDIO-1"
S19	1-516-995-00	SLIDE "MODE SELECT"
S20	1-552-539-00	KEY "VIDEO"
S21	1-552-539-00	KEY "ASSEMBLE"
S22	1-516-963-00	SLIDE "AUDIO MONITOR"

Ref. No.	Parts No.	Description
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MC-17 BOARD

	1-604-970-00	PRINTED CIRCUIT BOARD, MC-17
PL1	1-518-462-00	12V, 55mA FOR AUDIO CH-1 METER
PL2	1-518-462-00	12V, 55mA FOR AUDIO CH-2 METER
PL3	1-518-462-00	12V, 55mA FOR VIDEO/TRACKING METER

R1	1-212-376-00	METAL 22 5% 1W
RV1	1-226-395-00	VAR, CARBON 20K (B) AUDIO CH-1 LEVEL
RV2	1-226-395-00	VAR, CARBON 20K (B) AUDIO CH-2 LEVEL
RV3	1-224-525-00	VAR, CARBON 10K (B) VIDEO
RV4	1-226-983-00	VAR, CARBON 100K (B) TRACKING

S1	1-553-003-00	SLIDE "AUDIO LIMITER"
S2	1-553-003-00	SLIDE "VIDEO LEVEL"

MI-3 BOARD

1-603-732-00	PRINTED CIRCUIT BOARD, MI-3
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LM-7 BOARD

1-603-767-00	PRINTED CIRCUIT BOARD, LM-7
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Ref. No.	Parts No.	Description
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ML-1 BOARD

	1-603-588-00	PRINTED CIRCUIT BOARD, ML-1
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TM1	1-548-119-00	HOURS METER
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MP-12, CB-6 BOARD

	A-6711-274-A	MOUNTED CIRCUIT BOARD, MP-12 WITH CB-6
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All the diodes that are not listed in this board
are 1S1555 (Parts No. 8-719-815-55)

CB-6 BOARD

	1-604-971-00	PRINTED CIRCUIT BOARD, CB-6
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CN1	1-561-336-00	RECEPTACLE BNC "VIDEO-1 IN"
CN2	1-561-336-00	RECEPTACLE BNC "VIDEO-2 IN"

R1	1-214-105-00	METAL 75 1% 1/4W
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S1	1-516-970-00	SLIDE 75Ω
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MP-12 BOARD

C11	1-107-158-00	MICA 30PF 5% 500V
C14	1-107-208-00	MICA 18PF 5% 500V
C24	1-107-210-00	MICA 22PF 5% 500V
C34	1-107-158-00	MICA 30PF 5% 500V
C56	1-107-210-00	MICA 22PF 5% 500V
C60	1-107-158-00	MICA 30PF 5% 500V
C68	1-123-299-00	ELECT 1000 20% 6.3V
C87	1-109-683-00	MICA 270PF 1% 500V
C89	1-130-016-00	POLYPROPYLENE 680PF 5% 50V
C90	1-130-016-00	POLYPROPYLENE 680PF 5% 50V

Ref. No.	Parts No.	Description
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C91	1-107-159-00	MICA 33PF 5% 500V
C92	1-109-555-00	MICA 560PF 5% 100V
C184	1-107-206-00	MICA 15PF 5% 500V
C192	1-107-159-00	MICA 33PF 5% 500V
C193	1-107-210-00	MICA 22PF 5% 500V
C194	1-107-210-00	MICA 22PF 5% 500V
C195	1-107-202-00	MICA 10PF 5% 500V
C211	1-102-113-00	CERAMIC 390PF 10% 50V

CV1	1-141-246-00	TRIMMER 18P
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D12	8-719-915-43	FC54M
D23	8-719-815-59	1S1555-S
D24	8-719-127-07	RD2.7E-B
D52	8-719-709-25	1S1925-P
D53	8-719-709-25	1S1925-P

D601	8-719-709-25	1S1925-P
D602	8-719-709-25	1S1925-P

DL1	1-415-096-00	0.3μs
DL2	1-415-242-00	42ns
DL3	1-415-231-00	0.3μs

*DL1	1-415-096-31	0.3μs
*DL3	1-415-231-21	0.3μs

FL1	1-231-578-00	LPF
FL2	1-231-994-11	LPF
FL3	1-231-580-00	HPF
FL4	1-231-581-00	HPF

*FL1	1-231-578-21	LPF
*FL3	1-231-580-21	HPF
*FL4	1-231-581-21	HPF

IC1	8-759-240-51	TC4051BP, C-MOS (CD4051BE; RCA)
IC2	8-751-880-00	CX-188 (SONY)
IC3	8-751-300-00	CX-130 (SONY)
IC4	8-749-938-90	BX-389 (SONY)
IC5	8-751-310-00	CX-131A (SONY)

*S/N 21691 AND LATER (USA)
S/N 20861 AND LATER (CND)

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MP-12, CB-6

E. PARTS

Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
IC6	8-759-270-60	TA7060P (TOSHIBA)	Q35	8-729-663-47	2SC1364
IC7	8-751-300-00	CX-130 (SONY)	Q37	8-729-612-77	2SA1027R
IC8	8-743-730-00	BX-373 (SONY)	Q38	8-729-663-47	2SC1364
IC11	8-751-300-00	CX-130 (SONY)	Q39	8-729-663-47	2SC1364
IC12	8-751-300-00	CX-130 (SONY)	Q401	8-724-375-01	2SC403C
IC13	8-751-340-00	CX-134A (SONY)	Q402	8-724-375-01	2SC403C
IC14	8-749-938-90	BX-389 (SONY)	Q403	8-724-375-01	2SC403C
IC15	8-759-270-69	TA7069P (TOSHIBA)	Q601	8-724-375-01	2SC403C
IC701	8-759-240-66	TC4066BP, C-MOS (CD4066AE/BE; RCA)	Q602	8-724-375-01	2SC403C
LV3	1-411-100-00	BPT	Q701	8-724-375-01	2SC403C
LV21	1-407-566-00	VAR. 3.3	Q702	8-724-375-01	2SC403C
LV43	1-411-107-00	PEAKING	Q703	8-729-103-43	2SB734
LV45	1-411-107-00	PEAKING	Q704	8-724-375-01	2SC403C
LV52	1-407-268-00	VAR., 1.5mH	Q801	8-729-612-77	2SA1027R
Q1	8-724-375-01	2SC403C	Q802	8-724-375-01	2SC403C
Q2	8-724-375-01	2SC403C	R106	1-214-125-00	METAL 510 1% 1/4W
Q3	8-729-612-77	2SA1027R	R107	1-214-136-00	METAL 1.5K 1% 1/4W
Q4	8-724-375-01	2SC403C	R153	1-214-091-00	METAL 20 1% 1/4W
Q5	8-724-375-01	2SC403C	R154	1-214-091-00	METAL 20 1% 1/4W
Q6	8-761-622-00	2SC1636	R155	1-214-091-00	METAL 20 1% 1/4W
Q7	8-724-375-01	2SC403C	R156	1-214-091-00	METAL 20 1% 1/4W
Q8	8-724-375-01	2SC403C	RV1	1-224-251-XX	VAR, METAL 4.7K (B)
Q9	8-729-677-14	2SC2771	RV2	1-224-250-XX	VAR, METAL 2.2K (B)
Q10	8-729-677-14	2SC2771	RV3	1-224-250-XX	VAR, METAL 2.2K (B)
Q11	8-761-622-00	2SC1636	RV4	1-224-251-XX	VAR, METAL 4.7K (B)
Q12	8-724-375-01	2SC403C	RV5	1-224-251-XX	VAR, METAL 4.7K (B)
Q13	8-724-375-01	2SC403C	RV6	1-224-248-XX	VAR, METAL 470 (B)
Q16	8-761-622-00	2SC1636	RV7	1-224-251-XX	VAR, METAL 4.7K (B)
Q17	8-761-622-00	2SC1636	RV8	1-224-249-XX	VAR, METAL 1K (B)
Q21	8-761-622-00	2SC1636	RV11	1-224-251-XX	VAR, METAL 4.7K (B)
Q22	8-765-423-00	2SK152-3	RV12	1-224-248-XX	VAR, METAL 470 (B)
Q23	8-761-622-00	2SC1636	RV13	1-224-248-XX	VAR, METAL 470 (B)
Q24	8-765-423-00	2SK152-3	RV14	1-224-250-XX	VAR, METAL 2.2K (B)
Q25	8-724-375-01	2SC403C	RV15	1-224-250-XX	VAR, METAL 2.2K (B)
Q26	8-729-663-47	2SC1364	RV16	1-224-250-XX	VAR, METAL 2.2K (B)
Q27	8-761-622-00	2SC1636	RV17	1-224-249-XX	VAR, METAL 1K (B)
Q31	8-724-375-01	2SC403C	RV18	1-224-251-XX	VAR, METAL 4.7K (B)
Q32	8-724-375-01	2SC403C	RV19	1-224-251-XX	VAR, METAL 4.7K (B)
Q33	8-729-663-07	2SC1364	RV20	1-224-250-XX	VAR, METAL 2.2K (B)
Q34	8-724-375-01	2SC403C	RV22	1-224-250-XX	VAR, METAL 2.2K (B)
			RV64	1-224-550-21	VAR, METAL 220 (B)

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Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
RV401	1-224-250-XX	VAR, METAL 2.2K (B)	D7	8-719-200-02	10E-2
RV601	1-224-252-XX	VAR, METAL 10K (B)	D12	8-719-200-02	10E-2
RV701	1-224-254-XX	VAR, METAL 47K (B)	D13	8-719-200-02	10E-2
RV702	1-224-250-XX	VAR, METAL 2.2K (B)	D14	8-719-200-02	10E-2
			D15	8-719-200-02	10E-2
S1	1-552-101-00	SLIDE "NOISE CANCEL"	D16	8-719-200-02	10E-2
			D17	8-719-200-02	10E-2
T1	1-425-785-31	BURST AMP.	D31	8-719-200-02	10E-2
T2	1-426-017-00	HIGH FREQ.	D32	8-719-200-02	10E-2
T3	1-426-066-00	OUTPUT	D33	8-719-200-02	10E-2
T4	1-426-066-00	OUTPUT	D34	8-719-200-02	10E-2
T5	1-426-018-00	HIGH FREQ.	D35	8-719-200-02	10E-2
			D36	8-719-200-02	10E-2
T6	1-426-018-00	HIGH FREQ.	D37	8-719-200-02	10E-2
TH1	1-800-200-00	S-3K	IC3	8-759-345-38	HD14538BP, C-MOS (MC14538BCP; MOTOROLA)
			IC4	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)
X1	1-527-377-00	OSC. 4.267919 MHz			
X2	1-527-536-00	OSC. 4.579545 MHz	Q1	8-729-663-47	2SC1364
			Q2	8-729-374-02	2SB740
			Q3	8-760-413-10	2SC1475
			Q4	8-729-374-02	2SB740
			Q5	8-729-663-47	2SC1364
			Q6	8-760-413-10	2SC1475
			Q7	8-729-663-47	2SC1364
			Q8	8-729-663-47	2SC1364
			Q9	8-729-663-47	2SC1364
			Q10	8-729-663-47	2SC1364
MR-6 BOARD (UP TO 10140 (USA) UP TO 20010 (CND))			Q11	8-729-663-47	2SC1364
			Q12	8-729-374-02	2SB740
			Q13	8-760-413-10	2SC1475
			Q14	8-729-374-02	2SB740
			Q15	8-729-663-47	2SC1364
			Q16	8-760-413-10	2SC1475
			Q17	8-729-663-47	2SC1364
			Q18	8-729-663-47	2SC1364
			Q19	8-729-663-47	2SC1364
			Q20	8-729-663-47	2SC1364
			Q25	8-760-413-10	2SC1475
			Q26	8-729-199-80	2SD998
			Q27	8-729-663-47	2SC1364
			Q28	8-729-663-47	2SC1364
			Q31	8-729-199-80	2SD998
D2	8-719-200-02	10E-2			
D3	8-719-200-02	10E-2			
D4	8-719-200-02	10E-2			
D5	8-719-200-02	10E-2			
D6	8-719-200-02	10E-2			

 A-6725-232-A MOUNTED CIRCUIT BOARD,
MR-6

All the diodes that are not listed in this board
are 1S1555 (Parts No. 8-719-815-55)

NOTES:

- The shaded and  -marked components are critical to safety.
Replace only with same components as specified.

- Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

E. PARTS

Ref. No.	Parts No.	Description
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Q32	8-729-811-11	2SD1111
Q33	8-729-663-47	2SC1364
Q34	8-729-199-80	2SD998
Q35	8-729-811-11	2SD1111
Q36	8-729-663-47	2SC1364

Q37	8-729-663-47	2SC1364
Q38	8-729-199-80	2SD998

 R50	1-207-653-00	WIREWOUND 4.7 10% 4W
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 R63	1-247-072-00	CARBON 1.2 5% 1/4W
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 R73	1-247-072-00	CARBON 1.2 5% 1/4W
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 R83	1-247-072-00	CARBON 1.2 5% 1/4W
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MR-6 BOARD (10141 ~ 19910 (USA)
20011 ~ 20710 (CND))

 A-6725-232-B	MOUNTED CIRCUIT BOARD, MR-6
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All the diodes that are not listed in this board
are 1S1555 (Parts No. 8-719-815-55)

C5	1-131-370-00	TANTALUM 6.8 10% 25V
C6	1-131-370-00	TANTALUM 6.8 10% 25V
C12	1-131-370-00	TANTALUM 6.8 10% 25V
C15	1-131-341-00	TANTALUM 0.1 10% 25V

D2	8-719-200-02	10E-2
D3	8-719-200-02	10E-2
D4	8-719-200-02	10E-2
D5	8-719-200-02	10E-2
D6	8-719-200-02	10E-2

Ref. No.	Parts No.	Description
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D7	8-719-200-02	10E-2
D12	8-719-200-02	10E-2
D13	8-719-200-02	10E-2
D14	8-719-200-02	10E-2
D15	8-719-200-02	10E-2

D16	8-719-200-02	10E-2
D17	8-719-200-02	10E-2
D31	8-719-200-02	10E-2
D32	8-719-200-02	10E-2
D33	8-719-200-02	10E-2

D34	8-719-200-02	10E-2
D35	8-719-200-02	10E-2
D36	8-719-200-02	10E-2
D37	8-719-200-02	10E-2

IC1	8-759-135-80	μPC358C (LM358JG; TI)
IC2	8-759-135-80	μPC358C (LM358JG; TI)
IC3	8-759-240-66	TC4066BP, C-MOS (CD4066AE/BE; RCA)
IC4	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)
IC5	8-759-645-17	M54517P (MITSUBISHI)
IC6	8-759-345-38	HD14538BP, C-MOS (MC14538BCP; MOTOROLA)

Q1	8-729-663-47	2SC1364
Q2	8-729-374-02	2SB740
Q3	8-760-413-10	2SC1475
Q4	8-729-374-02	2SB740
Q5	8-729-663-47	2SC1364

Q6	8-760-413-10	2SC1475
Q7	8-729-663-47	2SC1364
Q8	8-729-663-47	2SC1364
Q9	8-729-663-47	2SC1364
Q10	8-729-663-47	2SC1364

Q11	8-729-663-47	2SC1364
Q12	8-729-374-02	2SB740
Q13	8-760-413-10	2SC1475
Q14	8-729-374-02	2SB740
Q15	8-729-663-47	2SC1364

Q16	8-760-413-10	2SC1475
Q17	8-729-663-47	2SC1364
Q18	8-729-663-47	2SC1364
Q19	8-729-663-47	2SC1364
Q20	8-729-663-47	2SC1364

NOTES:

1. The shaded and  -marked components are critical to safety.
Replace only with same components as specified.

2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in **Bold-Face type** will be processed, but allow for additional delivery time.

Ref. No. Parts No. Description

Q25 8-760-413-10 2SC1475
Q26 8-729-199-80 2SD998
Q27 8-729-663-47 2SC1364
Q28 8-729-663-47 2SC1364
Q31 8-729-199-80 2SD998

Q32 8-729-811-11 2SD1111
Q33 8-729-663-47 2SC1364
Q34 8-729-199-80 2SD998
Q35 8-729-811-11 2SD1111
Q36 8-729-663-47 2SC1364

Q37 8-729-663-47 2SC1364
Q38 8-729-199-80 2SD998
Q39 8-729-663-47 2SC1364
Q40 8-729-663-47 2SC1364
Q41 8-729-663-47 2SC1364

 R63 1-210-859-00 CARBON 1.2 1/8W 5%

 R73 1-210-859-00 CARBON 1.2 1/8W 5%

 R83 1-210-859-00 CARBON 1.2 1/8W 5%

 R91 1-207-653-00 WIREWOUND 4.7 4W 10%

RV1 1-224-251-XX VAR, METAL 4.7K (B)
RV2 1-224-251-XX VAR, METAL 4.7K (B)
RV3 1-224-251-XX VAR, METAL 4.7K (B)
RV4 1-224-251-XX VAR, METAL 4.7K (B)

Ref.No. Parts No. Description

MR-11 BOARD 19911 AND LATER (USA)
20711 AND LATER (CND)

 A-6725-358-A MOUNTED CIRCUIT BOARD,
MR-11

All the diodes that are not listed in this board are 1S1555.(Parts No. 8-719-815-55)

All the transistors that are not listed in this board are 2SC1364.(Parts No. 8-729-663-47)

D1 8-719-200-02 10E-2
D2 8-719-200-02 10E-2
D3 8-719-200-02 10E-2
D4 8-719-200-02 10E-2
D31 8-719-200-02 10E-2

D32 8-719-200-02 10E-2
D33 8-719-200-02 10E-2
D34 8-719-200-02 10E-2
D35 8-719-200-02 10E-2
D36 8-719-200-02 10E-2
D37 8-719-200-02 10E-2

IC1 8-759-135-80 uPC358C(LM358JG;TI)
IC2 8-759-135-80 uPC358C(LM358JG;TI)
IC3 8-759-240-66 TC4066BP(CD4066AE/BE;RCA)
IC4 8-759-240-69 TC4069UBP(CD4069UBE;RCA)
IC5 8-759-645-17 M54517P(MITSUBISHI)
IC6 8-759-345-38 HD14538BP
(MC14538BCP;MOTOROLA)

IC7 8-759-240-01 TC4001BP(CD4001AE/BE;RCA)
IC8 8-759-600-24 M54543L(MITSUBISHI)
IC9 8-759-600-24 M54543L(MITSUBISHI)

Q1 8-729-900-37 DTC124EF
Q2 8-729-900-37 DTC124EF
Q3 8-729-900-37 DTC124EF
Q4 8-729-900-37 DTC124EF
Q5 8-729-900-37 DTC124EF

Q6 8-729-900-37 DTC124EF
Q7 8-729-900-37 DTC124EF
Q8 8-729-900-37 DTC124EF
Q9 8-729-900-37 DTC124EF
Q10 8-729-900-37 DTC124EF

NOTES:

1. The shaded and  -marked components are critical to safety.
Replace only with same components as specified.

2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

E. PARTS

Ref. No.	Parts No.	Description
Q11	8-729-900-37	DTC124EF
Q12	8-729-900-37	DTC124EF
Q13	8-729-900-37	DTC124EF
Q25	8-729-177-43	2SD774
Q26	8-729-889-40	2SD894
Q27	8-729-663-47	2SC1364
Q28	8-729-663-47	2SC1364
Q31	8-729-199-80	2SD998
Q32	8-729-811-11	2SD1111
Q33	8-729-663-47	2SC1364
Q34	8-729-199-80	2SD998
Q35	8-729-811-11	2SD1111
Q36	8-729-663-47	2SC1364
Q37	8-729-663-47	2SC1364
Q38	8-729-199-80	2SD998
Q39	8-729-663-47	2SC1364
Q40	8-729-663-47	2SC1364

	R63	1-210-859-00	CARBON 1.2 5% 1/8W
	R73	1-210-859-00	CARBON 1.2 5% 1/8W
	R83	1-210-859-00	CARBON 1.2 5% 1/8W
	R91	1-207-674-00	WIREWOUND 4.7 10% 6W

RV1	1-224-251-XX	VAR, METAL 4.7K
RV2	1-224-251-XX	VAR, METAL 4.7K
RV3	1-224-251-XX	VAR, METAL 4.7K
RV4	1-224-252-XX	VAR, METAL 10K

PD-16 BOARD

	A-6717-212-A	MOUNTED CIRCUIT BOARD, PD-16
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D1	8-719-200-02	10E-2
D2	8-719-200-02	10E-2
D3	8-719-200-02	10E-2
D4	8-719-200-02	10E-2
D5	8-719-200-02	10E-2
D6	8-719-200-02	10E-2
D7	8-719-200-02	10E-2
D8	8-719-200-02	10E-2
D9	8-719-200-02	10E-2
D10	8-719-200-02	10E-2

NOTES:

- The shaded and  -marked components are critical to safety.
Replace only with same components as specified.

Ref. No.	Parts No.	Description
D11	8-719-200-02	10E-2
D12	8-719-200-02	10E-2
D13	8-719-200-02	10E-2
D14	8-719-200-02	10E-2
D15	8-719-200-02	10E-2
D16	8-719-904-55	GL-5HD5
Q1	8-729-811-11	2SD1111
Q2	8-729-663-47	2SC1364
Q3	8-729-199-80	2SD998
Q4	8-729-811-11	2SD1111
Q5	8-729-663-47	2SC1364
Q6	8-729-199-80	2SD998
Q7	8-729-811-11	2SD1111
Q8	8-729-663-47	2SC1364
Q9	8-729-199-80	2SD998
Q10	8-729-811-11	2SD1111
Q11	8-729-663-47	2SC1364
Q12	8-729-199-80	2SD998
Q13	8-729-811-11	2SD1111
Q14	8-729-663-47	2SC1364
Q15	8-729-199-80	2SD998

	R4	1-247-072-00	CARBON 1.2 5% 1/4W
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	R8	1-247-072-00	CARBON 1.2 5% 1/4W
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	R15	1-247-072-00	CARBON 1.2 5% 1/4W
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	R19	1-247-072-00	CARBON 1.2 5% 1/4W
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	R23	1-247-072-00	CARBON 1.2 5% 1/4W
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PH-4 BOARD

1-603-589-00 PRINTED CIRCUIT BOARD,
PH-4

PC1	1-806-232-11	MB-1102, TENSION REGULATOR
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- Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

Ref. No. Parts No. Description

PH-5 BOARD

	1-603-737-00	PRINTED CIRCUIT BOARD, PH-5
D1	8-719-951-04	BR5104S
Q1	8-729-810-20	SPS102

PT-9 BOARD

	1-605-018-00	PRINTED CIRCUIT BOARD, PT-9
Q1	8-729-382-64	2SC1826 (PT-9A)
Q1	8-729-377-13	2SA771 (PT-9B)
Q1	8-729-331-53	2SC2315 (PT-9C)

RE-5 BOARD

	A-6711-276-A	MOUNTED CIRCUIT BOARD RE-5
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All the diodes that are not listed in this board are 1S1555 (Parts No. 8-719-815-55)

C6	1-109-570-00	MICA 360PF 5% 500V
C16	1-109-570-00	MIAC 360PF 5% 500V

Q1	8-724-375-01	2SC403C
Q2	8-761-622-00	2SC1636
Q3	8-724-375-01	2SC403C
Q4	8-729-177-43	2SD774
Q5	8-729-374-02	2SB740

Q6	8-761-622-00	2SC1636
Q7	8-724-375-01	2SC403C
Q8	8-729-177-43	2SD774
Q9	8-729-374-02	2SB740

NOTES:

- The shaded and -marked components are critical to safety. Replace only with same components as specified.

Ref. No. Parts No. Description

	R9	1-246-418-15	5.1 5% 1/4W
	R10	1-246-418-15	5.1 5% 1/4W
	R19	1-246-418-15	5.1 5% 1/4W
	R20	1-246-418-15	5.1 5% 1/4W

RV1	1-224-660-00	VAR, METAL 1K (B)
RV2	1-224-660-00	VAR, METAL 1K (B)

RS-6 BOARD (UP TO 10140 (USA)) (UP TO 20010 (CND))

1-605-273-00 PRINTED CIRCUIT BOARD,
RS-6

All the diodes that are not listed in this board are 1S1555 (Parts No. 8-719-815-55)

C3	1-131-198-00	TANTALUM 6.8 10% 16V
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IC1	8-759-135-80	μPC358C (LM358JG; TI)
IC2	8-759-135-80	μPC358C (LM358JG; TI)
IC3	8-759-240-66	TC4066BP, C-MOS (CD4066AE/BE; RCA)
IC4	8-759-984-69	MB84069B, C-MOS (CD4069UBE; RCA)
IC5	8-759-645-17	M54517P (MITSUBISHI)

Q1	8-729-663-47	2SC1364
Q2	8-729-663-47	2SC1364

RV1	1-224-251-XX	VAR, METAL 4.7K (B)
RV2	1-224-251-XX	VAR, METAL 4.7K (B)
RV3	1-224-251-XX	VAR, METAL 4.7K (B)

- Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

Ref. No.	Parts No.	Description
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SV-31 BOARD

	A-6715-119-B	MOUNTED CIRCUIT BOARD, SV-31
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All the diodes that are not listed in this board
are 1S1555 (Parts No. 8-719-815-55)

C14	1-102-106-00	CERAMIC 100PF 10% 50V
C16	1-102-114-00	CERAMIC 470PF 10% 50V
C26	1-102-110-00	CERAMIC 220PF 10% 50V
C35	1-102-106-00	CERAMIC 100PF 10% 50V
C37	1-130-224-00	POLYPROPYLENE 0.015 5% 50V
C38	1-123-311-00	ELECT 1000 20% 10V
C75	1-102-106-00	CERAMIC 100PF 10% 50V
C76	1-102-106-00	CERAMIC 100PF 10% 50V
C88	1-102-110-00	CERAMIC 220PF 10% 50V
C601	1-161-185-00	CERAMIC 0.01 5% 50V
D12	8-719-911-19	1SS119
D13	8-719-911-19	1SS119
D15	8-719-982-04	ERB81-004
D16	8-719-982-04	ERB81-004
D24	8-719-156-07	RD5.6E-B
D42	8-729-119-92	1S1992
D52	8-719-911-19	1SS119
D53	8-719-911-19	1SS119
IC1	8-759-135-80	μ PC358C (LM358JG; TI)
IC2	8-759-345-38	HD14538BP, C-MOS (MC14538BCP; MOTOROLA)
IC3	8-759-240-11	TC4011BP, C-MOS (CD4011AE/BE; RCA)
IC4	8-759-745-50	NJM4558D-DS (RC4558; RAYTHEON)
IC5	8-759-240-53	TC4053BP, C-MOS (CD4053BE; RCA)
IC6	8-749-939-14	BX-3914 (SONY)
IC7	8-751-941-03	CX194B-3 (SONY)
IC8	8-759-240-53	TC4053BP, C-MOS (CD4053BE; RCA)
IC9	8-759-045-38	MC14538BCP, C-MOS (MOTOROLA)
IC10	8-759-132-40	μ PC324C (NSC)
IC11	8-759-135-80	μ PC358C (LM358JG; TI)
IC12	8-759-240-53	TC4053BP, C-MOS (CD4053BE; RCA)
IC13	8-759-135-80	μ PC358C (LM358JG; TI)
IC14	8-759-240-53	TC4053BP, C-MOS (CD4053BE; RCA)
IC15	8-759-135-80	μ PC358C (LM358JG; TI)

Ref. No.	Parts No.	Description
IC16	8-759-132-40	μ PC324C (NSC)
IC17	8-759-745-60	NJM4560D (JRC)
IC18	8-759-240-93	TC4093BP, C-MOS (CD4093BE; RCA)
IC19	8-759-240-30	TC4030BP, C-MOS (CD4030AE/BE; RCA)
IC20	8-759-240-82	TC4082BP, C-MOS (CD4082BE; RCA)
IC21	8-759-240-25	TC4025BP, C-MOS (CD4025AE/BE; RCA)
IC22	8-759-240-01	TC4001BP, C-MOS (CD4001AE/BE; RCA)
IC23	8-759-240-01	TC4001BP, C-MOS (CD4001AE/BE; RCA)
IC24	8-759-240-30	TC4030BP, C-MOS (CD4030AE/BE; RCA)
IC25	8-759-045-38	MC14538BCP, C-MOS (MOTOROLA)
IC26	8-759-135-80	μ PC358C (LM358JG; TI)
IC27	8-749-909-15	BX-3915A (SONY)
IC28	8-759-240-53	TC4053BP, C-MOS (CD4053BE; RCA)
IC29	8-759-135-80	μ PC358C (LM358JG; TI)
IC30	8-759-135-80	μ PC358C (LM358JG; TI)
IC31	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)
IC32	8-759-729-03	NJM2903D (JRC)
IC33	1-464-259-00	CORRECTION UNIT SWITCHING
Q1	8-729-663-47	2SC1364
Q2	8-729-663-47	2SC1364
Q3	8-729-663-47	2SC1364
Q4	8-729-663-47	2SC1364
Q5	8-729-663-47	2SC1364
Q6	8-729-663-47	2SC1364
Q7	8-729-663-47	2SC1364
Q8	8-729-103-43	2SB734
Q10	8-729-663-47	2SC1364
Q12	8-729-177-43	2SD774
Q13	8-729-663-47	2SC1364
Q14	8-729-663-47	2SC1364
Q15	8-729-663-47	2SC1364
Q16	8-729-663-47	2SC1364
Q17	8-729-663-47	2SC1364
Q18	8-729-602-67	2SA1026-7
Q19	8-729-663-47	2SC1364
Q20	8-729-663-47	2SC1364
Q21	8-729-663-47	2SC1364
Q22	8-729-663-47	2SC1364
Q23	8-729-663-47	2SC1364
Q24	8-729-663-47	2SC1364
Q25	8-729-663-47	2SC1364
Q26	8-729-663-47	2SC1364
Q27	8-729-663-47	2SC1364

NOTES:

- The shaded and -marked components are critical to safety.
Replace only with same components as specified.

- Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

Ref. No.	Parts No.	Description
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Q28	8-729-663-47	2SC1364
Q29	8-729-663-47	2SC1364
Q30	8-729-663-47	2SC1364
Q31	8-729-663-47	2SC1364
Q32	8-729-602-67	2SA1026-7

Q33	8-729-663-47	2SC1364
Q34	8-761-622-00	2SC1636
Q35	8-729-663-47	2SC1364
Q36	8-729-663-47	2SC1364
Q37	8-729-177-43	2SD774
Q38	8-729-663-47	2SC1364
Q39	8-729-602-67	2SA1026-7
Q501	8-729-663-47	2SC1364
Q502	8-729-663-48	2SC1364-8

Q503	8-729-663-47	2SC1364
Q504	8-729-663-47	2SC1364
Q505	8-729-663-47	2SC1364

 R30	1-207-636-00	WIREWOUND 100 10% 3W
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 R68	1-207-636-00	WIREWOUND 100 10% 3W
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R87	1-214-160-00	METAL 15K 1% 1/4W
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 R90	1-207-636-00	WIREWOUND 100 10% 3W
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R200	1-214-178-00	METAL 82K 1% 1/4W
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R201	1-212-710-00	METAL 220K 1% 1/2W
R285	1-244-853-00	CARBON 150 5% 1/2W
R343	1-244-845-00	CARBON 68 5% 1/2W

RV1	1-224-255-XX	VAR, METAL 100K (B)
RV2	1-224-254-XX	VAR, METAL 47K (B)
RV3	1-224-254-XX	VAR, METAL 47K (B)
RV4	1-224-254-XX	VAR, METAL 47K (B)
RV5	1-224-252-XX	VAR, METAL 10K (B)
*RV5	1-224-251-XX	VAR, METAL 4700 (B)
RV6	1-224-256-XX	VAR, METAL 220K (B)
RV7	1-224-254-XX	VAR, METAL 47K (B)
RV8	1-224-249-XX	VAR, METAL 1K (B)
*RV8	1-224-248-XX	VAR, METAL 470 (B)
RV9	1-224-252-XX	VAR, METAL 10K (B)
RV10	1-224-252-XX	VAR, METAL 10K (B)
*RV10	1-224-251-XX	VAR, METAL 4700 (B)
RV11	1-224-252-XX	VAR, METAL 10K (B)
*RV11	1-224-251-XX	VAR, METAL 4700 (B)
RV12	1-224-250-XX	VAR, METAL 2.2K (B)
RV13	1-224-250-XX	VAR, METAL 2.2K (B)

* S/N 10141 AND LATER (USA)
S/N 20011 AND LATER (CND)

NOTES:

- The shaded and  -marked components are critical to safety.
Replace only with same components as specified.

Ref. No.	Parts No.	Description
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RV14	1-224-250-XX	VAR, METAL 2.2K (B)
RV15	1-224-252-XX	VAR, METAL 10K (B)
RV16	1-224-254-XX	VAR, METAL 47K (B)
RV17	1-224-248-XX	VAR, METAL 470 (B)
RV18	1-224-254-XX	VAR, METAL 47K (B)

X1	1-527-816-00	OSC. 3.579545 MHz
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SW-43 BOARD

1-603-434-00	PRINTED CIRCUIT BOARD, SW-43
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IC1	8-719-104-42	PS4005 (NEC)
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SW-46 BOARD

1-603-590-00	PRINTED CIRCUIT BOARD, SW-46
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IC1	8-719-104-42	PS4005 (NEC)
IC2	8-719-104-42	PS4005 (NEC)

SW-50 BOARD

1-603-435-00	PRINTED CIRCUIT BOARD, SW-50
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IC1	8-719-104-42	PS4005 (NEC)
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Ref. No.	Parts No.	Description
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SY-68 BOARD

A-6717-211-A

MOUNTED CIRCUIT BOARD

SY-68

S/N UP TO 10440 (USA)

S/N UP TO 20110 (CND)

All the diodes that are not listed in this board
are 1S1555 (Parts No. 8-719-815-55)

C2	1-123-311-00	ELECT 1000 20% 10V
C3	1-123-311-00	ELECT 1000 20% 10V
C11	1-131-408-00	TANTALUM 1 10% 35V
C21	1-131-404-00	TANTALUM 0.22 10% 35V
C23	1-102-114-00	CERAMIC 470PF 10% 50V
C24	1-102-114-00	CERAMIC 470PF 10% 50V
C32	1-102-110-00	CERAMIC 220PF 10% 50V
C33	1-102-110-00	CERAMIC 220PF 10% 50V
C34	1-102-110-00	CERAMIC 220PF 10% 50V
C35	1-102-110-00	CERAMIC 220PF 10% 50V
C51	1-102-110-00	CERAMIC 220PF 10% 50V
C60	1-102-114-00	CERAMIC 470PF 10% 50V
C62	1-131-404-00	TANTALUM 0.22 10% 25V
CN1	1-560-454-00	40P
D9	8-719-147-07	RD4.7E-B
D20	8-719-911-19	1S119
IC1	8-759-906-80	LH0080 (SHARP)
IC2	8-759-906-82	LH0082 (SHARP)
IC3	8-759-754-49	2716S68E1C ROM (OKI)
IC4	8-759-754-60	2716S68E2B ROM (OKI)
IC5	8-759-754-61	2716S68E3B ROM (OKI)
IC6	8-759-104-44	μ PD444C, C-MOS (NEC)
IC7	8-759-104-44	μ PD444C, C-MOS (NEC)
IC8	8-759-223-68	TC40H368P, C-MOS (TOSHIBA)
IC9	8-759-220-02	TC40H002P, C-MOS (TOSHIBA)
IC10	8-759-903-90	SN74LS390N, TTL (TI)

Ref. No.	Parts No.	Description
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IC11	8-759-901-39	SN74LS139N, TTL (TI)
IC12	8-759-902-45	SN74LS245N, TTL (TI)
IC13	8-759-901-38	SN74LS138N, TTL (TI)
IC14	8-759-901-38	SN74LS138N, TTL (TI)
IC21	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC22	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC23	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC24	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC25	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC26	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC27	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC28	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC29	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC30	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC41	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC42	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC43	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC44	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC45	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC46	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC47	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC48	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC49	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC50	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC51	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)

NOTES:

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Replace only with same components as specified.

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Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
IC52	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC121	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)
IC53	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC122	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)
IC54	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC123	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)
IC55	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC124	8-759-240-30	TC4030BP, C-MOS (CD4030AE/BE; RCA)
IC56	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC125	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)
IC61	8-759-240-24	TC4024BP, C-MOS (CD4024AE/BE; RCA)	IC126	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)
IC101	8-759-987-47	MB8747, C-MOS (FUJITSU)	IC127	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)
IC102	8-759-240-21	TC4021BP, C-MOS (CD4021AE/BE; RCA)	IC128	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)
IC103	8-759-240-21	TC4021BP, C-MOS (CD4021AE/BE; RCA)	IC129	8-759-240-73	TC4073BP, C-MOS (CD4073BE; RCA)
IC104	8-759-240-22	TC4022BP, C-MOS (CD4022AE/BE; RCA)	IC130	8-759-240-73	TC4073BP, C-MOS (CD4073BE; RCA)
IC105	8-759-240-24	TC4024BP, C-MOS (CD4024AE/BE; RCA)	IC131	8-759-240-73	TC4073BP, C-MOS (CD4073BE; RCA)
IC107	8-759-245-28	TC4528BP, C-MOS (MC14528BCP; MOTOROLA)	IC132	8-749-240-73	TC4073BP, C-MOS (CD4073BE; RCA)
IC108	8-759-240-53	TC4053BP, C-MOS (CD4053BE; RCA)	IC133	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)
IC109	8-759-245-20	TC4520BP, C-MOS (MC14520BCP; MOTOROLA)	IC134	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)
IC110	8-759-345-38	HD14538BP, C-MOS (MC14538BCP; MOTOROLA)	IC202	8-759-645-17	M54517P (MITSUBISHI)
IC111	8-759-900-04	SN74LS04N, TTL (TI)	IC203	8-759-645-17	M54517P (MITSUBISHI)
IC112	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)	IC204	8-759-645-17	M54517P (MITSUBISHI)
IC113	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)	IC206	8-759-645-17	M54517P (MITSUBISHI)
IC114	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)	IC207	8-759-645-17	M54517P (MITSUBISHI)
IC115	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)	IC208	8-759-645-17	M54517P (MITSUBISHI)
IC116	8-759-240-01	TC4001BP, C-MOS (CD4001AE/BE; RCA)	IC209	8-759-645-17	M54517P (MITSUBISHI)
IC117	8-759-240-01	TC4001BP, C-MOS (CD4001AE/BE; RCA)	IC210	8-759-645-17	M54517P (MITSUBISHI)
IC118	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)	IC351	8-759-729-03	NJM2903D (JRC)
IC119	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)	IC352	8-759-705-58	NJM4558D-D (RC4558; RAYTHEON)
IC120	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)	IC353	8-759-145-58	μ PC4558C (RC4558; RAYTHEON)
			IC354	8-743-430-00	BX-343 (SONY)
			IC355	8-759-729-03	NJM2903D (JRC)
			L2	1-407-885-00	0.1 mH

NOTES:

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E. PARTS

Ref. No.	Parts No.	Description
Q2	8-729-612-77	2SA1027R
Q3	8-729-663-47	2SC1364
Q12	8-729-663-47	2SC1364
Q13	8-729-663-47	2SC1364
Q14	8-729-663-47	2SC1364
Q15	8-729-663-47	2SC1364
Q16	8-729-663-47	2SC1364
Q17	8-729-374-02	2SB740
Q18	8-760-413-10	2SC1475
Q19	8-729-663-47	2SC1364
Q20	8-729-663-47	2SC1364
Q31	8-729-663-47	2SC1364
Q32	8-729-663-47	2SC1364
Q33	8-729-663-47	2SC1364
Q34	8-729-663-47	2SC1364
Q35	8-729-663-47	2SC1364
Q36	8-729-663-47	2SC1364
Q37	8-729-663-47	2SC1364
Q38	8-729-663-47	2SC1364
Q39	8-729-663-47	2SC1364
Q40	8-729-663-47	2SC1364
Q41	8-729-663-47	2SC1364
Q42	8-729-663-47	2SC1364
Q43	8-729-663-47	2SC1364
Q44	8-729-663-47	2SC1364

 R1	1-212-359-00	METAL 0.82 5% 1W
R4	1-246-759-00	CARBON 10 5% 1/8W
R5	1-246-759-00	CARBON 10 5% 1/8W
R24	1-210-829-00	CARBON 5.1M 5% 1/4W
R188	1-246-759-00	CARBON 10 5% 1/8W

RV1	1-224-249-XX	VAR, METAL 1K (B)
RV2	1-224-253-XX	VAR, METAL 22K (B)

X1	1-527-827-00	OSC. 4.9152 MHz
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NOTES:

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Replace only with same components as specified.

Ref. No. Parts No. Description

SY-68 BOARD

 A-6717-211-A MOUNTED CIRCUIT BOARD,
SY-68
S/N 10441 ~ 15040 (USA)
S/N 20111 ~ 20410 (CND)

1-606-505-00 PRINTED CIRCUIT BOARD,
CM-13
S/N 10441 ~ 10890 (USA)

 A-6717-211-B MOUNTED CIRCUIT BOARD,
SY-68
S/N 15041 ~ 17510
S/N 20411 ~ 20660

 A-6717-211-C MOUNTED CIRCUIT BOARD,
SY-68
S/N 17511 AND LATER (USA)
S/N 20661 AND LATER (CND)

✓All the diodes that are not listed in this board
are 1SS119 (Parts No. 8-719-911-19)

C3	1-123-311-00	ELECT 1000 20% 10V
C17	1-131-341-00	TANTALUM 0.1 20% 35V
C23	1-102-114-00	CERAMIC 470PF 10% 50V
C24	1-102-114-00	CERAMIC 470PF 10% 50V
C32	1-102-110-00	CERAMIC 220PF 10% 50V

C33	1-102-110-00	CERAMIC 220PF 10% 50V
C34	1-102-110-00	CERAMIC 220PF 10% 50V
C35	1-102-110-00	CERAMIC 220PF 10% 50V
C51	1-102-110-00	CERAMIC 220PF 10% 50V
C60	1-102-114-00	CERAMIC 470PF 10% 50V

CN1	1-564-391-11	40P
CN21	1-560-363-00	RECEPTACLE, 12P
	1-561-521-00	HOUSING, 12P
CN22	1-560-363-00	RECEPTACLE, 12P
	1-561-521-00	HOUSING, 12P
CN23	1-560-363-00	RECEPTACLE, 12P
	1-561-521-00	HOUSING, 12P

D9	8-719-147-77	RD4.7E-B
IC1	8-759-241-75	TC40175BP, C-MOS (MI14175BCP; MOTOROLA)
IC2	8-759-241-75	TC40175BP, C-MOS (MI14175BCP; MOTOROLA)
IC3	8-759-345-03	HD14503BP, C-MOS (MC14503BCP; MOTOROLA)
IC4	8-759-345-03	HD14503BP, C-MOS (MC14503BCP; MOTOROLA)
IC5	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC6	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC7	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)

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Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
IC8	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC36	8-759-345-03	HD14503BP, C-MOS (MC14503BCP; MOTOROLA)
IC9	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC37	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC10	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC38	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC11	8-759-345-03	HD14503BP, C-MOS (MC14503BCP; MOTOROLA)	IC39	8-759-345-03	HD14503BP, C-MOS (MC14503BCP; MOTOROLA)
IC12	8-759-220-02	TC40H002P, C-MOS (TOSHIBA)	IC40	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC13	8-759-223-68	TC40H368P, C-MOS (TOSHIBA)	IC41	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC14	8-759-903-90	SN74LS390N (TI)	IC101	8-759-645-17	M54517P (MITSUBISHI)
IC15	8-759-901-39	SN74LS139N (TI)	IC102	8-759-645-17	M54517P (MITSUBISHI)
IC16	8-759-104-44	μ PD444C, C-MOS (NEC)	IC103	8-759-645-17	M54517P (MITSUBISHI)
IC17	8-759-104-44	μ PD444C, C-MOS (NEC) S/N UP TO 19910 (USA) S/N UP TO 20710 (CND)	IC104	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)
IC16	8-759-900-11	SN74LS11N (TI)	IC105	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)
IC17	8-759-905-23	MSM2128-15RS (OKI) S/N 19911 AND LATER (USA) S/N 20711 AND LATER (CND)	IC106	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)
IC18	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC107	8-759-645-17	M54517P (MITSUBISHI)
IC19	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC108	8-759-645-17	M54517P (MITSUBISHI)
IC20	8-759-901-38	SN74LS138N (TI)	IC109	8-759-729-03	NJM2903D (JRC)
IC21	8-759-901-38	SN74LS138N (TI)	IC110	8-759-729-03	NJM2903D (JRC)
IC22	8-759-906-82	LH0082, N-MOS (SHARP)	IC111	8-759-745-50	NJM4558D-DS (RC4558; RAYTHEON)
IC23	8-759-906-80	LH0080, N-MOS (SHARP)	IC112	8-759-145-58	μ PC4558C (RC4558; RAYTHEON)
IC24	8-759-758-16	MSM2716S68E1G, P-ROM (OKI)	IC114	8-759-645-17	M54517P (MITSUBISHI)
IC25	8-759-758-17	MSM2716S68E2G, P-ROM (OKI)	IC115	8-759-245-20	TC4520BP, C-MOS (MC14520BCP; MOTOROLA)
IC26	8-759-758-18	MSM2716S68E3G, P-ROM (OKI) S/N UP TO 19910 (USA) S/N UP TO 20710 (CND)	IC116	8-743-430-00	BX-343 (SONY)
IC26	8-759-759-97	MBM2764-S68EV1 (FUJITSU) S/N 19911 AND LATER (USA) S/N 20711 AND LATER (CND)	IC117	8-759-240-21	TC4021BP, C-MOS (CD4021AE/BE; RCA)
IC27	8-759-902-45	SN74LS245N (TI)	IC118	8-759-240-21	TC4021BP, C-MOS (CD4021AE/BE; RCA)
IC28	8-759-240-24	TC4024BP, C-MOS (CD4024AE/BE; RCA)	IC119	8-759-645-17	M54517P (MITSUBISHI)
IC29	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC120	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)
IC30	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC121	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)
IC31	8-759-345-03	HD14503BP, C-MOS (MC14503BCP; MOTOROLA)	IC122	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)
IC32	8-759-345-03	HD14503BP, C-MOS (MC14503BCP; MOTOROLA)	IC123	8-759-645-17	M54517P (MITSUBISHI)
IC33	8-759-345-03	HD14503BP, C-MOS (MC14503BCP; MOTOROLA)	IC124	8-759-240-01	TC4001BP, C-MOS (CD4001AE/BE; RCA)
IC34	8-759-345-03	HD14503BP, C-MOS (MC14503BCP; MOTOROLA)	IC125	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)
IC35	8-759-345-03	HD14503BP, C-MOS (MC14503BCP; MOTOROLA)	IC126	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)
			IC127	8-759-240-22	TC4022BP, C-MOS (CD4022AE/BE; RCA)

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Ref. No. Parts No. Description

FRAME

	1-413-069-00	SWITCHING REGULATOR (UR-01)
	1-226-996-21	ROTARY ENCODER
	1-526-559-00	SOCKET, FOR POWER TR
	1-551-812-00	CORD, POWER

 CN1001 1-509-546-00 3P AC INLET

 CN1002 1-509-841-00 3P AC OUTLET

CN1005 1-509-891-00 RECEPTACLE BNC "VIDEO-1
OUT"

CN1006 1-509-891-00 RECEPTACLE BNC "VIDEO-2
OUT"

CN1007 1-508-945-00 RECEPTACLE, 7P MALE
"DUB IN"

CN1008 1-561-045-00 RECEPTACLE, 7P FEMALE
"DUB OUT"

CN1011 1-509-891-00 RECEPTACLE BNC "RF OUT"

CN1012 1-509-891-00 RECEPTACLE BNC "SC IN"

CN1013 1-507-732-00 JACK, PIN 2P "AUDIO LINE
CH-1/L IN"

CN1014 1-507-732-00 JACK, PIN 2P "AUDIO LINE
CH-2/R IN"

CN1015 1-507-251-XX JACK JM-35 M-10 "AUDIO
MONITOR"

CN1016 1-507-732-00 JACK, PIN 2P "AUDIO LINE
CH-1/L OUT"

CN1017 1-507-732-00 JACK, PIN 2P "AUDIO LINE
CH-2/R OUT"

CN1018 1-507-473-XX JACK JM-35 M-7A "RX DATA"

CN1019 1-507-733-00 JACK, MIC IN

CN1021 1-507-553-00 JACK "HEADPHONES"

CN1022 1-509-891-00 RECEPTACLE BNC "EXT SYNC IN"

CN1024 1-561-671-00 RECEPTACLE, 8P FEMALE "TV"

CN1025 1-561-583-00 RECEPTACLE, 33P FEMALE
"REMOTE"

1-561-066-00 CONTACT

Ref. No. Parts No. Description

CS1001 1-586-633-00 CONDENSATION SENSOR

H1002 A-6709-102-A DRUM ASS'Y UPPER

H1003 8-825-513-20 EPP170-58 "CTL PB/FULL
ERASE"

H1004 8-829-358-31 EPP150-5803B "AUDIO
ERASE/CTL R/P/ AUDIO R/P"

M1001 A-6709-365-A HEAD DRUM ASS'Y DUH-18D-R
(BHR-1000F)

M1002 8-838-019-01 BHF-1600A "CAPSTAN"

M1003 8-835-047-01 MNR-4000A "REEL"

M1004 8-835-056-01 DNR-1002A "THREADING"

M1005 8-835-055-01 DNR-4700A "CASSETTE
COMPARTMENT"

ME1001 1-520-393-00 AUDIO CH-1

ME1002 1-520-393-00 AUDIO CH-2

ME1003 1-520-440-00 VIDEO/TRACKING

PL1001 1-518-455-00 12V, 55mA CASSETTE
COMPARTMENT

PL1002 1-518-455-00 12V, 55mA CASSETTE
COMPARTMENT

PL1003 1-518-455-00 12V, 55mA CASSETTE
COMPARTMENT

PM1001 1-454-285-00 12V, 8/52 OHM "TAKE UP
IDLER"

PM1002 1-454-284-00 12V, 10/90 OHM "TAKE UP
BRAKE"

PM1003 1-454-284-00 12V, 10/90 OHM "REW,
FF SEARCH"

PM1004 1-454-285-00 12V, 8/52 OHM "SUPPLY IDLER"

PM1005 1-454-284-00 12V, 10/90 OHM "SUPPLY
BRAKE"

PM1006 1-454-283-00 12V, 80 OHM "SKEW"

PM1007 1-454-284-00 12V, 10/90 OHM "SEARCH"

PM1008 1-454-286-00 12V, 6/35 OHM "PINCH"

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FRAME, UR-01 (PW-67)

E. PARTS

Ref. No.	Parts No.	Description
Q1001	8-760-222-01	2SA762
Q1002	8-760-222-01	2SA762
Q1003	8-729-325-67	2SD256-Y
Q1004	8-729-325-67	2SD256-Y
R1001	1-207-619-00	WIREWOUND 0.82 3W
RV1001	1-228-218-00	VAR CARBON 500x2 "HEADPHONES LEVEL"

	S1001	1-553-515-00	ROCKER "POWER"
	S1002	1-516-970-00	SLIDE "COLOR LOCK"
	S1004	1-516-779-XX	SLIDE "MONITOR TV"

SWITCHING REGULATOR

	1-413-069-00	UR-01
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	1-560-036-00	6P CN TO CN PIN
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	CN101	1-560-437-00	4P PLUG "AC IN"
		1-561-427-00	4P HOUSING
		1-561-432-00	CONTACT

CN201	1-560-438-00	5P PLUG "DC OUT"
	1-561-428-00	5P HOUSING
	1-561-432-00	CONTACT

PW-67 BOARD

1-604-137-00	PRINTED CIRCUIT BOARD, PW-67
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C101	1-130-398-00	POLYPROPYLENE 1200PF 600V
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	C102	1-130-610-00	POLYPROPYLENE 0.1 125V
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	C103	1-161-746-00	CERAMIC 1000PF 10% 125V
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	C104	1-161-746-00	CERAMIC 1000PF 10% 125V
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C107	1-130-579-00	CERAMIC 0.01 10% 630V
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Ref. No.	Parts No.	Description
C108	1-125-240-00	ELECT 470 200V
C109	1-125-240-00	ELECT 470 200V
C110	1-123-659-00	ELECT 47 250V
C111	1-123-659-00	ELECT 47 250V
C209	1-123-326-00	ELECT 3300 20% 16V
C210	1-123-326-00	ELECT 3300 20% 16V
C211	1-123-326-00	ELECT 3300 20% 16V
C212	1-123-326-00	ELECT 3300 20% 16V

D101	8-719-834-10	SM3G-41
D102	8-719-911-55	U05G
D103	8-719-911-55	U05G
D104	8-719-900-94	V09E
D105	8-719-182-26	RD8.2E-B3Z

D106	8-719-162-07	RD6.2E-B
D107	8-719-815-85	1S1585
D108	8-719-815-85	1S1585
D201	8-719-903-02	ESAC33-02C
D202	8-719-903-02	ESAC33-02C

D203	8-719-903-02	ESAC33-02C
D204	8-719-200-02	10E-2
D205	8-719-182-26	RD8.2E-B3Z
*D205	8-719-115-07	RD15E-B
D206	8-719-923-48	1S2348H

	F101	1-532-603-00	125V, 7A, 145°C
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	L101	1-459-215-00	120
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	L102	1-459-215-00	120
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L201	1-421-398-12	200
L202	1-421-431-00	CHOKE
L203	1-421-370-00	CHOKE

* S/N 10141 AND LATER (USA)
S/N 20011 AND LATER (CND)

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Ref. No.	Parts No.	Description
Q101	8-729-962-52	2SC2625
Q102	8-729-962-52	2SC2625
Q103	1-806-095-11	2SC2523
Q104	8-729-177-43	2SD774
Q201	8-729-331-53	2SC2315

R101	1-205-622-00	CEMENT 33 5W
R102	1-205-711-00	CEMENT 15 5W
R103	1-244-933-00	CARBON 330K 1/2W
R104	1-244-933-00	CARBON 330K 1/2W
R105	1-202-727-00	SOLID 4.7M 1/2W

R107	1-247-090-00	CARBON 20 1/4W
R108	1-247-090-00	CARBON 20 1/4W
R109	1-247-091-00	CARBON 22 1/4W
R113	1-247-123-00	CARBON 470 1/4W
R115	1-247-123-00	CARBON 470 1/4W

R201	1-205-622-00	CEMENT 33 5W
R202	1-205-627-00	CEMENT 0.015 5W
R205	1-247-090-00	CARBON 20 1/4W

Ref. No.	Parts No.	Description
D301	8-719-200-02	10E-2
D302	8-719-115-07	RD15E

IC301	8-759-904-94	TL494CN
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Q301	8-729-612-77	2SA1027R
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R302	1-247-104-00	CARBON 1/4W 75
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RV301	1-226-826-00	VAR, METAL 300 (B)
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 T101	1-446-911-00	MAIN CONVERTER
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 T102	1-421-430-00	LFT
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 T103	1-437-085-00	DRIVE
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 T104	1-446-912-00	SUB CONVERTER
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T201	1-421-432-00	CHOKE
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PW-68 BOARD

1-604-138-00	PRINTED CIRCUIT BOARD, PW-68
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C301	1-130-652-00	POLYPROPYLENE 0.0036 10% 100V
C302	1-108-859-00	MYLAR 1500PF 20% 50V
C305	1-130-349-00	POLYPROPYLENE 0.1 10% 100V

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15-4. PACKING MATERIAL AND ACCESSORY
(SUPPLIED)

 1-551-812-00	CORD, POWER
3-672-714-00	CUSHION (UPPER, REAR)
3-672-715-00	CUSHION (UPPER, FRONT)
3-672-716-00	CUSHION (LOWER, REAR)
3-672-717-00	CUSHION (LOWER, FRONT)
3-668-996-00	CARTON, INDIVIDUAL
3-701-632-00	BAG, POLY
3-701-648-00	BAG, POLY
3-783-528-24	MANUAL, INSTRUCTION
3-783-528-33	MANUAL, INSTRUCTION (FOR CND)

15-5. FIXTURE (OPTIONAL)

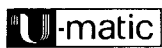
J-6001-820-A	DRUM ECCENTRICITY GAUGE (3)
J-6001-830-A	DRUM ECCENTRICITY GAUGE (2)
J-6001-840-A	DRUM ECCENTRICITY GAUGE (1)
J-6001-930-A	DRUM ECCENTRICITY GAUGE (4)
J-6002-290-A	DIHEDRAL ADJUSTING SCREW
J-6009-830-A	FLATNESS PLATE
J-6130-010-A	REEL TABLE HEIGHT CHECK BASE JIG
J-6130-020-A	REEL TABLE HEIGHT CHECK JIG
J-6150-020-A	PINCH LEVER ADJUSTMENT JIG
Y-2031-001-0	CLEANING FLUID
2-034-697-00	CLEANING PIECE
3-702-215-01	TORQUE MEASUREMENT TAPE (100 mm DIA.)
3-702-216-01	BACK TENSION ADJUSTMENT JIG
7-661-018-01	SONY OIL
7-732-050-20	TENSION SCALE (50 g FULL SCALE)
7-732-050-30	TENSION SCALE (100 g FULL SCALE)
7-732-050-40	TENSION SCALE (200 g FULL SCALE)
7-732-050-50	TENSION SCALE (500 g FULL SCALE)
8-960-015-03	ALIGNMENT TAPE, RR5-2SA
9-911-053-00	THICKNESS GAUGE

Standard products Head Demagnetizer, HE-4

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VIDEOCASSETTE RECORDER

SP0162

V0-5850

SUPPLEMENT-2

Please file this SUPPLEMENT-2 to your MANUAL

Ref. No. Parts No. Description

SY-68 BOARD Serial No. 10441 and higher (USA)
Serial No. 20111 and higher (CND)

 A-6717-211-A MOUNTED CIRCUIT BOARD,
SY-68

1-606-505-00 PRINTED CIRCUIT BOARD,
CM-13

All the diodes that are not listed in this board
are 1S1555 (Parts No. 8-719-815-55)

C3	1-123-311-00	ELECT 1000 20% 10V
C17	1-131-341-00	TANTALUM 0.1 20% 35V
C23	1-102-114-00	CERAMIC 470PF 10% 50V
C24	1-102-114-00	CERAMIC 470PF 10% 50V
C32	1-102-110-00	CERAMIC 220PF 10% 50V
C33	1-102-110-00	CERAMIC 220PF 10% 50V
C34	1-102-110-00	CERAMIC 220PF 10% 50V
C35	1-102-110-00	CERAMIC 220PF 10% 50V
C51	1-102-110-00	CERAMIC 220PF 10% 50V
C60	1-102-114-00	CERAMIC 470PF 10% 50V
CN1	1-560-454-00	40P
CN21	1-560-363-00	RECEPTACLE, 12P
	1-561-521-00	HOUSING, 12P
CN22	1-560-363-00	RECEPTACLE, 12P
	1-561-521-00	HOUSING, 12P
CN23	1-560-363-00	RECEPTACLE, 12P
	1-561-521-00	HOUSING, 12P
D9	8-719-147-77	RD4.7E-B
IC1	8-759-241-75	TC40175BP, C-MOS (MI14175BCP; MOTOROLA)
IC2	8-759-241-75	TC40175BP, C-MOS (MI14175BCP; MOTOROLA)
IC3	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC4	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC5	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC6	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC7	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC8	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC9	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC10	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)

Ref. No. Parts No. Description

IC11	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC12	8-759-220-02	TC40H002P, C-MOS (TOSHIBA)
IC13	8-759-223-68	TC40H368P, C-MOS (TOSHIBA)
IC14	8-759-903-90	SN74LS390N (TI)
IC15	8-759-901-39	SN74LS139N (TI)
IC16	8-759-104-44	μPD444C, C-MOS (NEC)
IC17	8-759-104-44	μPD444C, C-MOS (NEC)
IC18	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC19	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC20	8-759-901-38	SN74LS138N (TI)
IC21	8-759-901-38	SN74LS138N (TI)
IC22	8-759-906-82	LH0082, N-MOS (SHARP)
IC23	8-759-906-80	LH0080, N-MOS (SHARP)
IC24	8-759-754-50	2716S68E1D, P-ROM (OKI)
IC25	8-759-755-05	2716S68E2E, P-ROM (OKI)
IC26	8-759-755-06	2716S68E3E, P-ROM (OKI)
IC27	8-759-902-45	SN74LS245N (TI)
IC28	8-759-240-24	TC4024BP, C-MOS (CD4024AE/BE; RCA)
IC29	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC30	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC31	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC32	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC33	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC34	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC35	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC36	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC37	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC38	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)
IC39	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)
IC40	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)

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IC41	8-759-241-75	TC40175BP, C-MOS (MC14175BCP; MOTOROLA)	IC131	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)
IC101	8-759-645-17	M54517P (MITSUBISHI)	IC132	8-759-240-73	TC4073BP, C-MOS (CD4073BE; RCA)
IC102	8-759-645-17	M54517P (MITSUBISHI)	IC133	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)
IC103	8-759-645-17	M54517P (MITSUBISHI)	IC134	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)
IC104	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)	IC135	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)
IC105	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)	IC136	8-759-987-47	MB8747, C-MOS (FUJITSU)
IC106	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)	IC137	8-759-345-38	HD14538BP, C-MOS (MC14538BCP; MOTOROLA)
IC107	8-759-645-17	M54517P (MITSUBISHI)	IC138	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)
IC108	8-759-645-17	M54517P (MITSUBISHI)	IC139	8-759-240-53	TC4053BP, C-MOS (CD4053BE; RCA)
IC109	8-759-729-03	NJM2903D (JRC)	IC140	8-759-240-30	TC4030BP, C-MOS (CD4030AE/BE; RCA)
IC110	8-759-729-03	NJM2903D (JRC)	IC141	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)
IC111	8-759-145-58	μ PC4558C (RC4558; RAYTHEON)	IC142	8-759-345-38	HD14538BP, C-MOS (MC14538BCP; MOTOROLA)
IC112	8-759-145-58	μ PC4558C (RC4558; RAYTHEON)	IC143	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)
IC114	8-759-645-17	M54517P (MITSUBISHI)	IC144	8-759-240-01	TC4001BP, C-MOS (CD4001AE/BE; RCA)
IC115	8-759-245-20	TC4520BP, C-MOS (MC14520BCP; MOTOROLA)	IC145	8-759-240-73	TC4073BP, C-MOS (CD4073BE; RCA)
IC116	8-743-430-00	BX-343 (SONY)	IC146	8-759-240-73	TC4073BP, C-MOS (CD4073BE; RCA)
IC117	8-759-240-21	TC4021BP, C-MOS (CD4021AE/BE; RCA)	IC147	8-759-240-24	TC4024BP, C-MOS (CD4021AE/BE; RCA)
	8-759-240-21	TC4021BP, C-MOS (CD4021AE/BE; RCA)			
	8-759-645-17	M54517P (MITSUBISHI)			
IC120	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)			
IC121	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)			
IC122	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)			
IC123	8-759-645-17	M54517P (MITSUBISHI)			
IC124	8-759-240-01	TC4001BP, C-MOS (CD4001AE/BE; RCA)			
IC125	8-759-240-69	TC4069UBP, C-MOS (CD4069UBE; RCA)	L2	1-407-885-00	0.1mH
IC126	8-759-240-81	TC4081BP, C-MOS (CD4081BE; RCA)	Q1	8-729-331-53	2SC2315
IC127	8-759-240-22	TC4022BP, C-MOS (CD4022AE/BE; RCA)	Q2	8-729-612-77	2SA1027R
IC128	8-759-240-71	TC4071BP, C-MOS (CD4071BE; RCA)	Q3	8-729-663-47	2SC1364
IC129	8-759-900-04	SN74LS04N (TI)	Q6	8-729-631-02	2SC1310
IC130	8-759-045-03	MC14503BCP, C-MOS (MOTOROLA)	Q12	8-729-663-47	2SC1364
			Q13	8-729-663-47	2SC1364
			Q14	8-729-663-47	2SC1364
			Q15	8-729-663-47	2SC1364
			Q16	8-729-663-47	2SC1364
			Q17	8-729-103-43	2SB734

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Ref. No.	Parts No.	Description
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Q18	8-729-177-43	2SD774
Q19	8-729-663-47	2SC1364
Q20	8-729-663-47	2SC1364
Q31	8-729-663-47	2SC1364
Q32	8-729-663-47	2SC1364
Q33	8-729-663-47	2SC1364
Q34	8-729-663-47	2SC1364
Q35	8-729-663-47	2SC1364
Q36	8-729-663-47	2SC1364
Q37	8-729-663-47	2SC1364
Q38	8-729-663-47	2SC1364
Q39	8-729-663-47	2SC1364
Q40	8-729-663-47	2SC1364
Q41	8-729-663-47	2SC1364
Q42	8-729-663-47	2SC1364
Q43	8-729-663-47	2SC1364
Q44	8-729-663-47	2SC1364

	R1	1-212-359-00	METAL 0.82 5% 1W
	R24	1-210-829-00	CARBON 5.1M 5% 1/4W
	R401	1-207-619-00	WIREWOUND 0.82 10% 3W

RV1	1-224-249-XX	VAR, METAL 1K (B)
RV2	1-224-253-XX	VAR, METAL 22K (B)
RV3	1-224-253-XX	VAR, METAL 22K (B)

X1	1-527-827-00	OSC., 4.9152MHz
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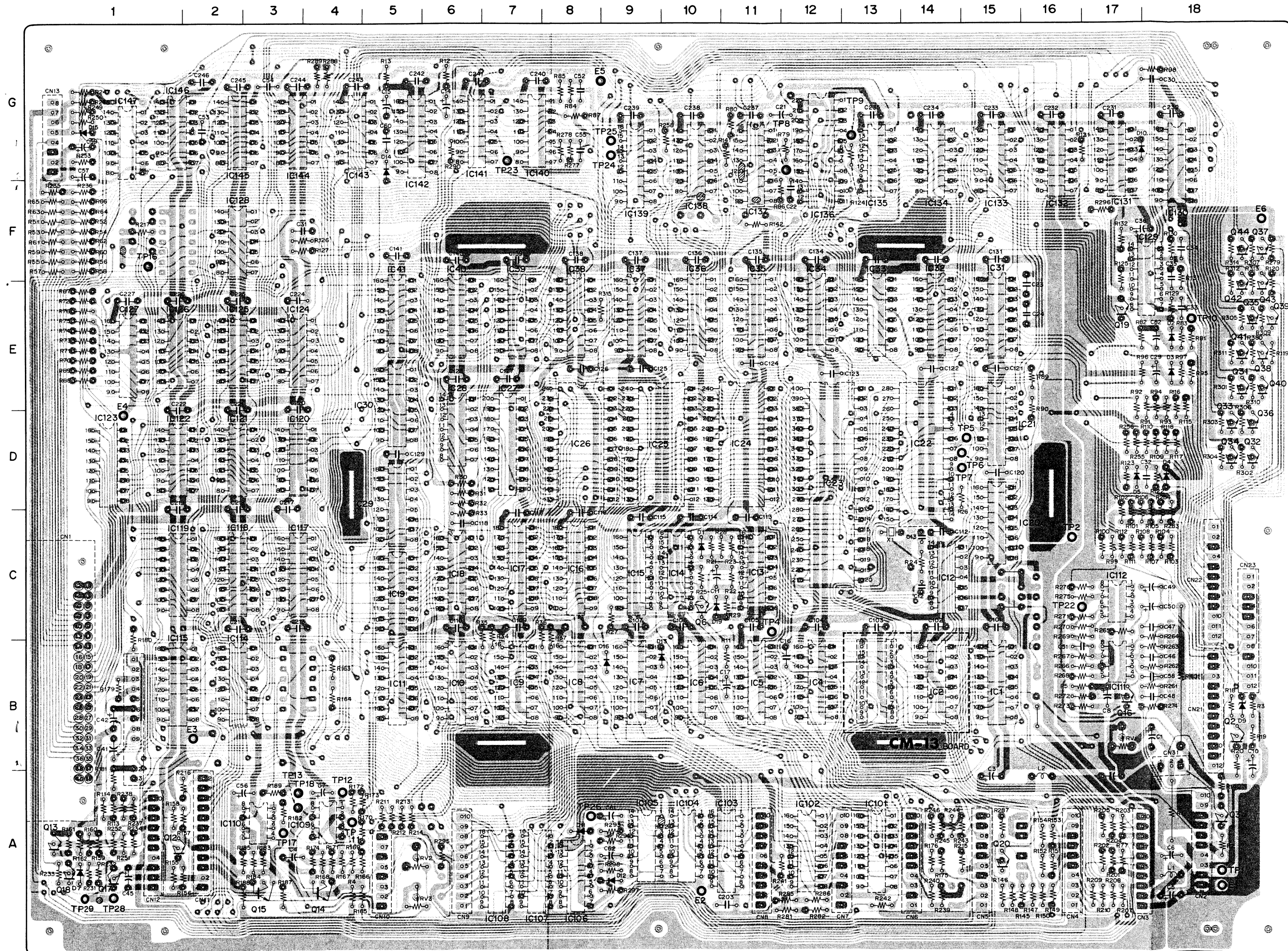
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SY-68/PT-9

SY-68/PT-9



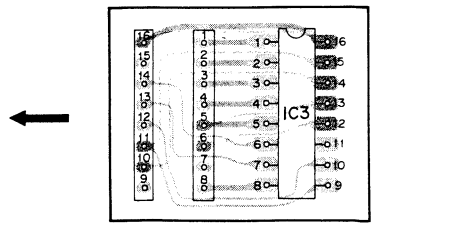
CN1	B-1	IC25	D-9	Q2	B-1
CN2	A-18	IC26	D-8	Q3	B-1
CN3	A-18	IC27	D-7	Q6	C-1
CN4	A-16	IC28	D-6	Q12	A-1
CN5	A-15	IC29	D-5	Q13	A-1
CN6	A-13	IC30	D-5	Q14	A-1
CN7	A-12	IC31	E-15	Q15	A-1
CN8	A-11	IC32	E-14	Q16	B-1
CN9	A-6	IC33	E-13	Q17	A-1
CN10	A-5	IC34	E-12	Q18	A-1
CN11	A-2	IC35	E-11	Q19	E-1
CN12	A-1	IC36	E-10	Q20	A-1
CN13	G-1	IC37	E-9	Q31	E-1
CN21	B-18	IC38	E-8	Q32	D-1
CN22	C-18	IC39	E-7	Q33	D-1
CN23	C-18	IC40	E-6	Q34	D-1
CN31	B-18	IC41	E-5	Q35	E-1

D1	C-10	IC101	A-13	Q36	D-1
D2	E-18	IC102	A-12	Q37	F-1
D3	E-18	IC103	A-10	Q38	E-1
D4	D-18	IC104	A-10	Q39	E-1
D5	D-18	IC105	A-9	Q40	E-1
D7	A-1	IC106	A-8	Q41	E-1
D9	B-18	IC107	A-7	Q42	E-1
D10	F-18	IC108	A-7	Q43	E-1
D11	A-8	IC109	A-4	Q44	F-1
D12	A-9	IC110	A-3		
D13	B-9	IC111	B-17	RV1	B-1
D14	F-5	IC112	B-17	RV2	A-5
D15	G-1	IC113	B-2	RV3	A-5
D16	B-8	IC114	B-1		

E1	A-18	IC115	B-1	TP1	A-1
E2	A-10	IC116	B-1	TP2	C-1
E3	B-1	IC117	C-3	TP4	C-1
E4	D-1	IC118	C-2	TP5	D-1
E5	G-6	IC119	C-1	TP6	D-1
E6	F-18	IC120	D-3	TP7	D-1

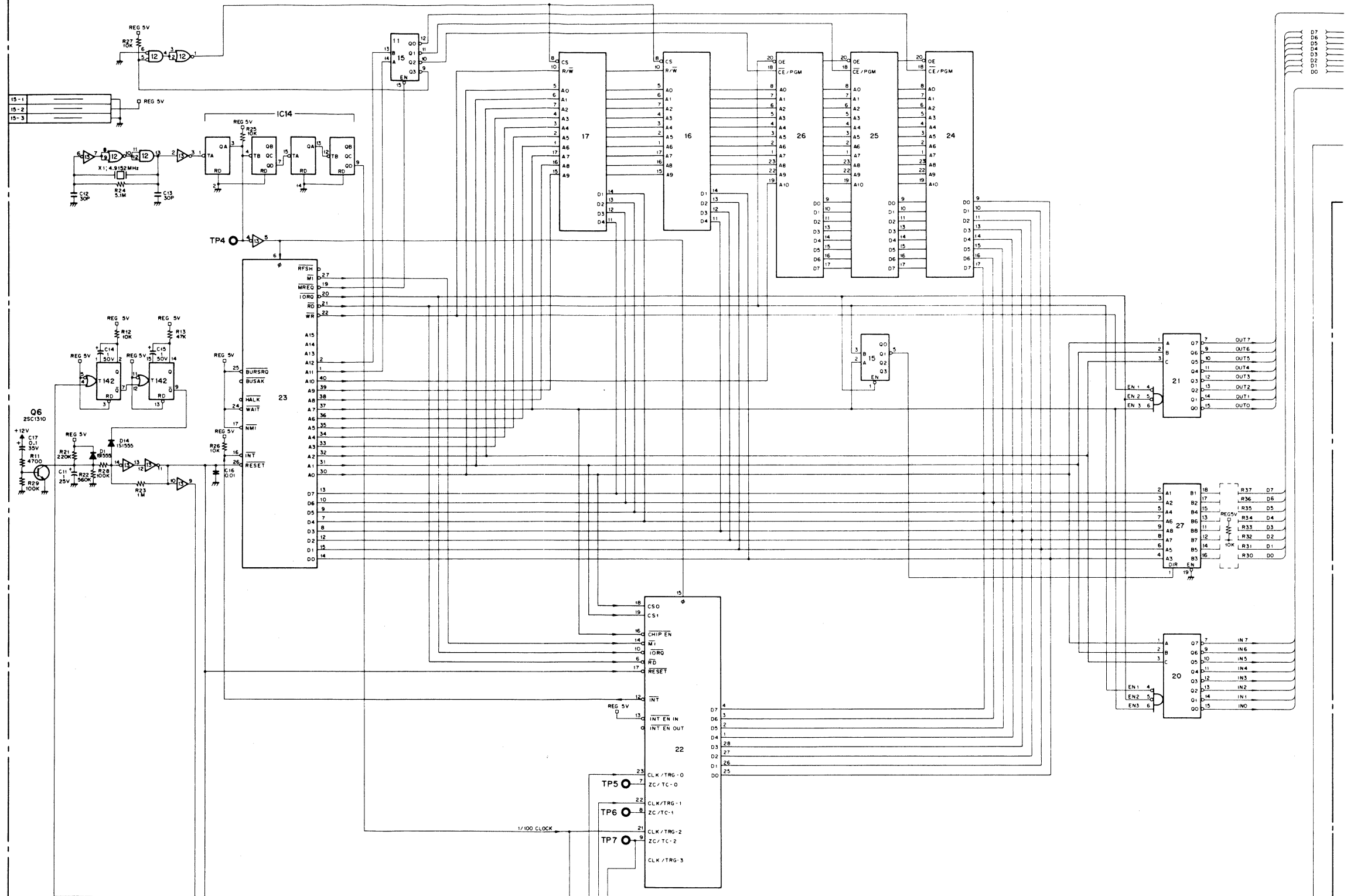
IC1	B-15	IC121	D-2	TP8	F-1
IC2	B-14	IC122	D-1	TP9	G-1
IC3	B-13	IC123	D-1	TP10	E-1
IC4	B-12	IC124	E-3	TP11	A-1
IC5	B-11	IC125	E-2	TP12	A-4
IC6	B-10	IC126	E-1	TP13	A-3
IC7	B-9	IC127	E-1	TP16	F-1
IC8	B-8	IC128	F-2	TP17	A-3
IC9	B-7	IC129	F-18	TP18	A-3
IC10	B-6	IC130	G-18	TP22	C-1
IC11	B-5	IC131	G-17	TP23	G-7
IC12	C-14	IC132	G-16	TP24	G-9
IC13	C-11	IC133	G-15	TP25	G-8
IC14	C-10	IC134	G-14	TP26	A-1
IC15	C-9	IC135	G-13	TP28	A-1
IC16	C-8	IC136	G-12	TP29	A-1
IC17	C-7	IC137	G-11		
IC18	C-6	IC138	G-10		
IC19	C-5	IC139	G-9		
IC20	D-15	IC140	G-7		
IC21	D-15	IC141	G-6		
IC22	D-14	IC142	G-5		
IC23	D-12	IC143	G-4		
IC24	D-11	IC144	G-3		
		IC145	G-2		
		IC146	G-1		
		IC147	G-1		

X1	C-1				
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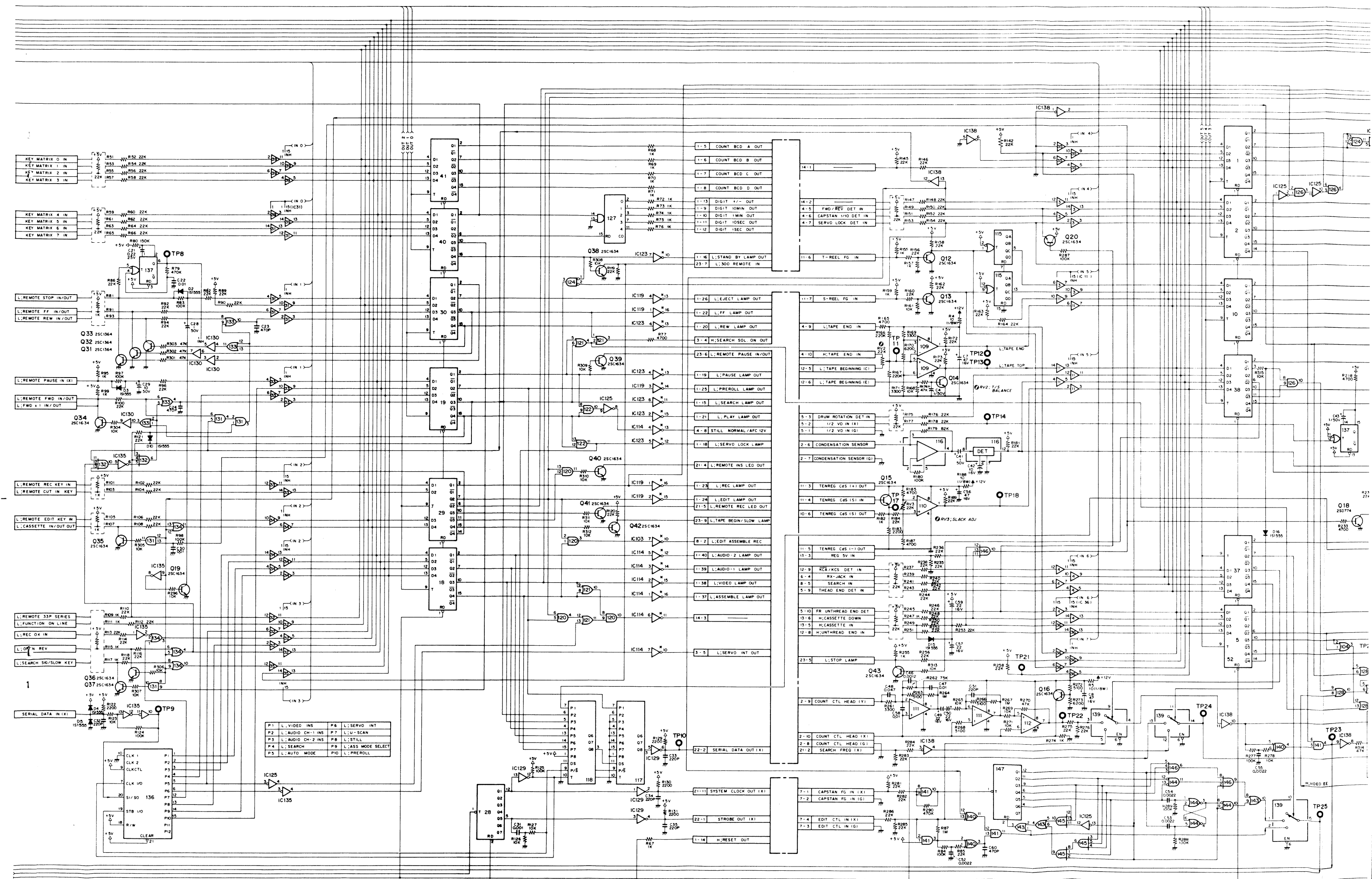
SY-68/PT-9

SY-68/PT-9

SY-68 (SYSTEM CONTROL)
PT-9S/N 10441 and later (USA)
S/N 20111 and later (CND)

REF	TYPE	+12V	+5V	GND
IC1	TC40175BP	16	8	
IC2	TC40175BP	16	8	
IC3	MC14503BCP	16	8	
IC4	MC14503BCP	16	8	
IC5	TC40175BP	16	8	
IC6	TC40175BP	16	8	
IC7	TC40175BP	16	8	
IC8	TC40175BP	16	8	
IC9	TC40175BP	16	8	
IC10	TC40175BP	16	8	
IC11	MC14503BCP	16	8	
IC12	TC40H002P	14	7	
IC13	TC40H368P	16	8	
IC14	SN74LS390N	16	8	
IC15	SN74LS139N	16	8	
IC16	μPD444C	18	9	
IC17	μPD444C	18	9	
IC18	TC40175BP	16	8	
IC19	TC40175BP	16	8	
IC20	SN74LS368N	16	8	
IC21	SN74LS139N	16	8	
IC22	LH0082	24	5	
IC23	LH0080	11	29	

REF	TYPE	+12V	+5V	GND
IC24	2716568E1D	24	12	
IC25	2716568E2E	24	12	
IC26	2716568E3E	24	12	
IC27	SN74LS245N	20	10	
IC28	TC 40248P	14	7	
IC29	TC40175 BP	16	8	
IC30	TC40175 BP	16	8	
IC31	MC14503BCP	16	8	
IC32	MC14503BCP	16	8	
IC33	MC14503BCP	16	8	
IC34	MC14503BCP	16	8	
IC35	MC14503BCP	16	8	
IC36	MC14503BCP	16	8	
IC37	TC40175BP	16	8	
IC38	TC40175BP	16	8	
IC39	MC14503BCP	16	8	
IC40	TC40175BP	16	8	
IC41	TC40175BP	16	8	
IC101	M54517P	-	-	8
IC102	M54517P	-	-	8
IC103		-	-	8
IC104	TC4071BP	-	14	7
IC105	TC4073BP	14	7	





The shaded and  -marked components are critical to safety.